Modern 1943 Machine Shop

PLEDGED to all-out aid to America's fighting forces, NORMA-HOFFMANN is devoting all its resources and its 32-years' experience to the production of PRECISION BEARINGS for the Army, Navy and

PRMA-HOFFMANN BEARINGS CORPORATION, STAMFORD, CONN., U. S. A. BALL, ROLLER AND THRUST BEARINGS . FOUNDED 1911

Air Corps, and for manufacturers of armament and equipment.

"Know How" to do it Better - Gaster... with TOGAN AIR and HYDRAULI EQUIPMENT



with

and Hyduc-

anutrial able ines, d to with

e is Hy-

and Hy-

ilicow-

ves, ant will

on any

ted

Ind.

Machine Shop

JANUARY, 1943 VOLUME 15 . NUMBER 8



HOWARD CAMPBELL, Editor

Published monthly by GARDNER PUBLICATIONS, Inc. 431 Main St., Cincinnati, Ohio

DON G. GARDNER
President and General Manager

JOHN M. KRINGS Advertising Manager

RICHARD S. KLINE GENE J. SCHWARBER 431 Main St., Cincinnati MAIn 0182

G. M. FILLMORE 342 Madison Ave. New York Murray Hill 6-3899

GEORGE H. MEYERS
Tribune Tower, Chicago
Superior 2290

Member



Printed in U. S. A.

Copyrighted

CONTENTS

Tank Production at Fisher Body	
Foreman Training at General Electric	124
Drawing Shells Several Times Deeper Than the Press Stroke By C. W. Hinman	138
Health Hazards of Artificial Abrasive Grinding Wheels	148
"DC" Available from "AC" Lines	154
70 Suggestions for Economy	.162
Modern Equipment at Work	
-Drill Fixture Saves One Day Per Week, By C. P. Fisher	178
—Safety Device for Turret Lathes	180
—Light Minimizes Chance of Error	
—"Stitching" Fins to Parachute Flares	
—Portable Electric Gages Speed Production	
-Automatic Temperature Control for Pot-Type Furnace	
Ideas from Readers	
-Method of Reducing Amount of Machining Required,	
By R. Richards	198
—Center Scraper, By C. F. Fitz	
-Graphic Dimension Translation for Drawings,	
By John E. Hyler	205
-Simple Center Finder, by A. H. Waychoff	
-Milling With a Grinding Attachment	
—Brazed Strippers Lengthen Die Life	
Tools for National Defense	220
New Shop Equipment	232
Catalog Library	372
Services Directory	374
Cartoon Drawing, by Freed	
"Where to Find It"	394
"The Last Word"	
Index to Advertisements	

ARMSTRONG



STOP WASTING HIGH SPEED STEEL IN FORGED TOOLS

See that in your plant no valuable high speed steel is wasted—is used for "solid" forged tool when the same high speed steel used as cutter bits in ARMSTRONG TOOL HOLDERS would go ten times as far. Always more efficient than forged tools ARMSTRONG TOOL HOLDERS are essential under war conditions for all standard operations on lathes, planers, slotters and shapers, to save man-hours, to save man-hours and to save high speed steel.

ARMSTRONG TOOL HOLDERS save man-hours by eliminating all forging of tools and reducing tool grinding 70%. They save machine-hours by ending delays waiting for tools and by permitting far higher speed and heavier feeds. They save high speed steel by making every ounce do the work that would require a pound of high speed steel in a bar tool. Be sure you are using that ARMSTRONG TOOL HOLDERS on every possible operation—they come in over 250 sizes and that

ARMSTRONG BROS. TOOL CO.

"THE TOOL HOLDER PEOPLE"

CHICAGO, U. S. A. 328 N. FRANCISCO AVE. Eastern Warehouse and Sales: 199 Lafayette St., New York, N. Y.

MASTRONG TOOL HOLDERS Are Used to Clark 16% of the Machine Shops and Tool B

Michi tion. intere MAC

at the traini ssist

COL strok manu the p

Norte the c readi

direc

even

and :

ANUARY, 1943

Vol. 15, No. 8

CINCINNATI, OHIO

We Present ---

- as our feature article this month a "trip on paper" through a tank arsenal in Michigan that is operated by Fisher Body Division of General Motors Corporacon. From the standpoint of equipment and tooling this is one of the most interesting articles we have ever had the privilege of publishing in MODERN MACHINE SHOP.

- as our number two article - an outline of the methods used to train foremen t the Schenectady Works of the General Electric Company. The executive training program is carried on under the watchful eye of Wendell M. Nelson, assistant to the manager, who wrote this article.

- on page 138 - a short article by an expert die designer in which he presents comparatively new method of drawing shells several times deeper than the stroke of the press. This article will be of special interest to die designers and manufacturers of sheet metal products where drawing is an important part of the process.

- on page 148 - an abstract of a study by the Personnel Director of the Norton Company made to determine the possible health hazards incidental to the operation of grinding wheels. This article should be listed as "required reading" by all machine shop executives.

- on page 154 - a presentation of a comparatively new method of converting direct current into alternating current at the point of use. In these days when d took uld go many electric accessories such as magnetic chucks, magnetic testing equipment, as and so on are used in the machine shop, the matter of duplicate wiring for "DC" is important.

- on page 162 - a list of suggestions for economy in the operation of the using machine shop, among which any machine shop executive can find at least a few that will apply to his shop or department. And economy is a good English word, even if it isn't applied much in these days.

- a number of excellent ideas under the heading "Modern Equipment at Work" s. A and some original designs and gadgets in the Ideas from Readers.

- and a happy and successful New Year to you.

ducing nitting

do the



Tank Production at Fisher Body

The building of Army tanks involves a number of interesting operations and many special tools, some of which are discussed in this article

By HOWARD CAMPBELL Editor, MODERN MACHINE SHOP

THE statement is frequently made that the present conflict is a "mechanized" war, but not until one has an opportunity to see an Army Corps in motion does one realize just what this term "mechanized" means. Motor vehicles were used to a considerable extent during World War I, and it was during that war that the mobile fort commonly known as the "tank" was developed.

The tank was originally a British invention and was used by the British quite successfully on the Continent. When the United States joined in that conflict an effort was made to train American soldiers for tank fighting

and a special training camp was a up for training members of the Tan Corps. A few tanks were borrowe from England for training purpose and that was the extent of the American Tank Corps equipment on this side of the water.

Of course, all the motor equipment used by the Army is not in the form of tanks. In 1918 an infantry division was equipped with 4,400 horses an 153 motor vehicles, the motor vehicle comprising a total of 3,500 mechanized horsepower. In 1942 a mechanized division is equipped with motor units of various kinds amounting to a total of 400,000 horsepower.—12

have theo Re from Ame

time

Ame the stant prod the j el sj inclu

> Fig. 1 groun

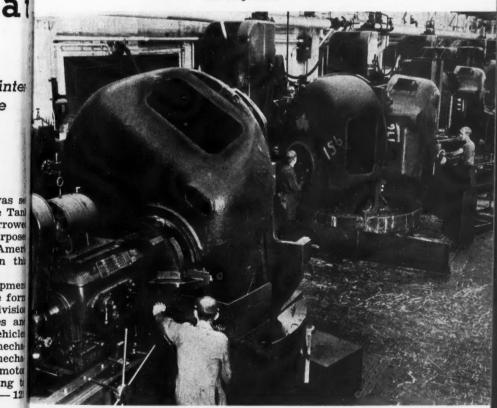
times the divisional horsepower of 1918. Each division has its own mechanized unit—and this time we have the tanks in fact and not in theory.

Reports that have come back to us from the North African front where American tanks have recently faced the German product in battle substantiate our belief that America is producing the world's best tanks. For the production of Army tanks several special arsenals have been built, including a new tank arsenal recently constructed by the Fisher Body Di-

vision of General Motors at a point in the Middle West. In the arsenal and in one of its former body plants Fisher Body is building the type M-4 all-welded tank.

Most of the American tanks that have been built up to this time have been known as the M-3, "General Grant," or the M-4, "General Sherman." The M-4 is of more recent design than the M-3 and it is noticeable that with each new design that is developed the armament grows progressively heavier. The M-3 carries a reasonably small turret cannon and

Fig. 1—Tank Turrets are Machined on Special Combination Machines. In the Immediate Foreground a Special Focte-Burt Machine is Being Used to Finish the Hatch Opening, Pistol Porthole, and Hinge Block



y, 194 January, 1943

MODERN MACHINE SHOP 1

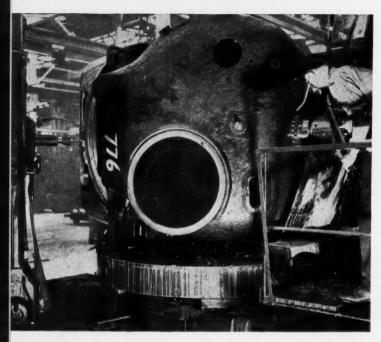


Fig. 2—Three Turn Fig. are Set Up Simul Facineously on this Hu F Faceplate so that Ingersoll Horizon Milling Machine o Work on one of t Openings of one To While a Fish Built Drilling and To ping Machine is bing Used to Drill a Tap Holes in Anoth Turret. The Roug Third Turret is place into position machines on the other Two Turrets

spe

a st

tacl use tool eacl the In gro can com

c h

whi

perf

ret.

chin

cons

mill

spec

ing

sid

ran

it p

an (

side

ret

Fish

Turre

Insid

nomi

Turr

this job. The of eration consist of boring th hatch opening a the left side the body, fat ing and chamfe

ing the pistol porthole in the side, an machining the hinge block for the door. The chuck is set directly line with the spindles of two power driven units which are located at a angle of 90 degrees from each other so that the tool head operated by on unit can be used to bore and face th hatch opening in the top of the tw ret body while the spindle in th other unit is being used to machin the pistol porthole in one side of th body. The two power units make ne cessary the use of two operators i order to obtain maximum efficienc Fig. from this arrangement.

for the l The two turrets are mounted on rotary or indexing table so that i Positi Mac one station the finished turret cal be unloaded and a rough turret load ing ! Easi ed in place while the two machine are in operation. This results in I Mac valuable saving in loading time.

The hatch opening is 29 inches d ameter and the tool revolves at

probably several light machine guns. The M-4, which is the largest of the tanks shown at the head of this article, carries a distinctly heavier turret cannon and three visible machine guns. Both of these tanks are of the 30-ton size, but the M-4 has a castor welded hull and a revolving turret which permits the concentration of fire from its cannon in any direction.

The walls and turret of the tank are made from heavy armor plate which has been formed to shape. Some of these shapes can be seen in Fig. 1 where several tank bodies and turrets are shown in process of having various openings machined on a row of machines that have been especially designed for this job.

In the immediate foreground in Fig. 1 a tank turret is set up and clamped to a huge faceplate which. in turn, is anchored to a rotary chuck which is part of a Foote-Burt machine that was especially designed for

MODERN MACHINE SHOP

Horizon chine c f one To a Fish g and To ine is b Drill m n Anoth e Roug

is place

n whil nes wo WO

The or

consist

ng th

ning a

side o

y, fac

namfe

ide, an

for th

ctly i power

l at a

other

by on

ace th

he tur

in th achin of th ke ne tors i

d on

ree Turn Fig. 3 — Boring and p Simul Facing the Bottom this Hu Face of a Tank so that

speed of 20 r.p.m., a star feeding attachment being used to feed the tool 0.015 inch at each revolution of the spindle.

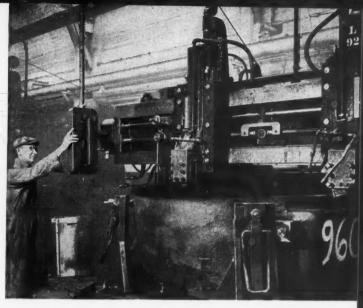
In the background of Fig. 1 can be seen the combination machines with

which various other operations are performed on the tank body and turret. Each one of these special machines, shown in operation in Fig. 2, consists of an Ingersoll horizontal milling machine on one side and a special Fisher-built horizontal drilling and tapping machine on the other

side. This arrangement makes it possible to mill an opening in one side of a tank turret while the Fisher machine is

ret is Shown Set Up for Drilling Holes in d on the Bottom Face. The hat i Position, then the load ing for Drilling. It is chine Easier and More Economical to Place the Machine Inside the Turret than to Place the Turret on a

Machine



being used to drill, countersink and tap.

Provision is made for holding three turrets on the faceplate; thus one of the operators can change a finished piece for an unmachined piece in one of the stations while a second turret is being milled at the second station and the drilling operation on



ies d at 1

y. 194

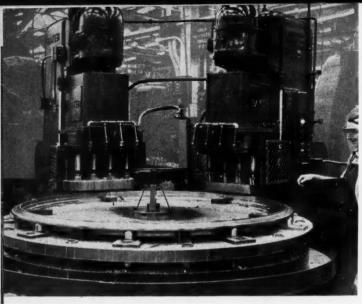


Fig. 5—Drilling and Countersinking Hole in a Turret Ring, Ui ing a Rotating Table and Double Bake Bros. Drill

Fig.

a S

The

Met Race

in o

hea

imn

the

whi

the

4 t

show

spec

for

a nu

of v

the

tom

turr

the

prod

oper

ial

built

swui

To

setti was cause more

In

the third turret is proceeding at the third station. It is obvious that the only nonproductive time on this job is the time required to index the turret between operations.

The operation shown in Fig. 3 is that of boring and facing the turret, which is done in a boring mill of Betts design but built in the Fisher plant especially for this job. The turret is first clamped into a fixture before the fixture is set or the table, thus cutting to a minimum the set-up time. On the machine table, the

turret is located upside down in the fixture, and is held in position by stud clamps which are spaced at regular intervals around the table, as shown Built to withstand the demands of heavy production on an unusually tough material, the construction of this machine permits taking a cu approximately one inch deep in the

roughing operation. The rough colu facing, finish fac the l ing and boring operations a retion performed com-head plete with this colur machine, the fin inger ishing tool, held the r



casti Fig. 6—Cutting Interchine nal Teeth in the Steel Ring Upon Which the place Turret Fixture Reunit volves. The Fellowing Set Gear Shaper Used for Set this Operation wather Expecially Designed. Especially Designed the i

Jenuar

Fig. 7—Flame Hardening a Ball Race in a Steel Turret Ring. The Flame Hardening Method Hardens the Race Without Distorting the Ring

ng and Hole ing, Us

Bake

ecially

. The

s first

nto a

re the

set or

thus

mini-

set-up

he ma-

in the

y stud

egular

shown

nds of

sually

ion d

a. cut

in the

opera-

rough

h fac

e. the

in one of the tool heads, following immediately after the roughing tool, which is held in the other head.

In Fig. 4 an M-4 tank turret is shown set up on a special machine for the drilling of a number of holes of various sizes in the finished bottom surface in the turret. To obtain the maximum production on this operation a special machine was

built with two heads which can be swung radially around the machine column, which is in the exact center of the base of the machine.

boring To get the workpiece into the posiare tion shown in Fig. 4, the two work com heads are lifted as one unit from the h this column by an overhead crane. This ne fin ingenious method of actually bringing held the machine to the large casting, and setting it directly inside the casting. was devised by Fisher engineers because it can be done in this manner more quickly and cheaper than the casting could be set onto the mag Interchine. The turret is then dropped into he Stee place over the column, after which the Reunit consisting of the two work heads Fellowis set back in place on the column in n wathe position in which it is shown in signed the illustration. Inasmuch as each



head is powered by its own motor, the removal and replacement of the machining unit is very simple indeed.

Before the machining unit is returned to the machine column, however, a circular jig plate is dropped into position on the machine surface of the turret, where it is clamped in place. With the unit in position for drilling, it is a simple matter for the operator to start the drill in one head feeding down through its bushing while he changes the position of the drill in the other head. As the heads are independent of each other, each head can be moved as required. With this equipment some 14 holes are drilled ranging from 17/32 inch to one inch in diameter.

The tank must be constructed so that, when necessary, the turret can

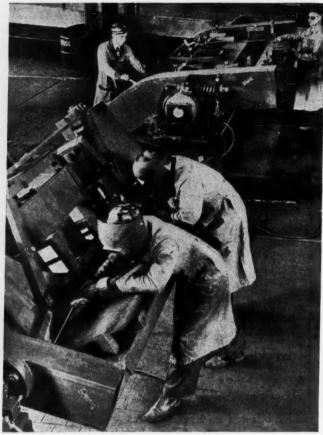


Fig. 8 — Sub-assemblies are Welded To gether in a Trunnion Fixture which can be Revolved so that All Welding can be done in the "Down" Position

be revolved easily and quickly. In order to obtain this facility the contact surface of the turret is provided with a ring of special steel which functions in contact with a mating ring anchored to the tank body. Ball races in the contacting surface provide for quick and easy operation of the turret, while a high spurring gear on one unit mating with a pinion on the other unit provides for

stability. In Fig. 5 a turret ring is shown set up on the faceplate of a double Baker Bros. drilling machine to have

a series of hole drilled and countersunk. at a time by the first unit, after which the ring is indexed to the second unit when the four holes an countersunk. The machine units are set just fa enough apart s that after the first four hole have been drilled and indexed to the second unit all subsequent

holes will be drilled in the correct positions so that, when the operation is finished, all holes will be evenly spaced. With this equipment hole are drilled and countersunk complete in 22 minutes.

The operation shown in process it holding Fig. 6 is the cutting of the interna Ameri teeth in the steel ring upon which finish This and the turret fixtures revolves. operation is unusual, not because of with a of the the method employed, but because of the unusual size and design of the BRO Fellows Gear Shaper with which the operation is performed. The ring rest

Four holes are drilled

MODERN MACHINE SHOP

specia

LINES BEHIND THE LINES

"ALL THIS AND TIRES TOO!" SAYS THE 100% CONVERTED RUBBER INDUSTRY, NOW MANUFACTURING IMPLEMENTS OF MECHANIZED WAR





ded To runnion can be

be done

holes coun-Tout drilled by the after ring i the

where

les an

c. The

nite st far

art s

er the

hole drilled

ced to

unit

equent

ect po

tion is

evenly

ch the

hole BROACH DEmplett SIGNED, with reduces set-up, special engineered loading, and clamping and cess it holding fixture, by nterna American (above). which finishes radius production This and cuts teeth rate! use of with a single pass ecause of the tool.

of the BROACHING IS BETTER g rest

BROACHING MACHINE (right), American made V-11/2-4 ton, reduces set-up, operating time - does a precision job at a BY SPEEDILY CONVERTING part of its plant to the manufacture of guns and other munitions, rubber eminently deserves credit as one of the production lines behind the firing lines. Noteworthy is the industry's recognition of broaching as a better way to do many metal-working jobs—the only right way to do some!

TEETH IN GUNNER'S OUAD-RANT (left) are one of the forms which only broaching can do with the speed and precision required.

American BROACH MACHINE ANN ARBOR, MICHIGAN

BROACHING MACHINES PRESSES BROACHING TOOLS SPECIAL MACHINERY



Fig. 9 — The Giam Trunnion Fixture Shown Here will hold a Complete Tank Hull and Revolve it a Complete Circle so that the Welders can Always Weld Downward



electric motor at the exact speed required to obtain the best results An Air Reduction Sales torch used. As is usual in flame harden ing, the flame is directed upon the area to be hard ened and the speed of the work is controlled s as to obtain the correct amount penetration.

The welding process is an im-

portant factor in the mass production of Army tanks, inasmuch as it provides a fast and economical method of joining the various steel section and parts together in the least possible time and with the maximum safety. Some of the sub-assemblie are fabricated by welding and an incorporated in the tank assembly. However, in the welding of the sub-assemblies it is necessary that the several parts in each assembly be held in position in a jig so that the assembly will be perfect in its construction

In the foreground of Fig. 8 tw welders are shown at work building a sub-assembly, the parts being held in the correct relation with ead other by clamping them in a fixture which swings on a trunnion so the

on a rotary table which makes a complete revolution in one hour and 53 minutes. In this time teeth are generated in the inside of the ring.

The design of the huge steel ring which serves as the foundation or operating base for the turret includes a ball race; thus the steel ring actually becomes a huge ball thrust bearing. In order to withstand the gruelling services to which it will be put, the ball race must be hardened—but without taking any chance on distorting the gear teeth. Accordingly, the ball race is hardened by the "flame" method as shown in Fig. 7.

To perform this flame hardening operation the ring is clamped to the circular table of a Ransome welding positioner which is rotated by an x t u re
will hold
e Tank
olve it in
Circle so
lers can
l Down-

otor at speed obtain resulta luction ch i usual arden ame i on the hard the e work ed in the ount of ١. relding an im-

nethod ections it poskimum mblies ad are embly, e subne seve held

luction

it pro

assemuction 8 two pilding g held







Fig. 10—"Laying the Track" for a M-4 Tank at the End of a Moving Conveyor Assembly Line
With the Addition of the Track, the Tank is Virtually Complete

it can be revolved in a complete circle. The use of a "turn-over" fixture of this type makes it possible for the welders to weld always in a downward position instead of vertical or overhead. Obviously, welding downward instead of vertical or overhead produces better welds in addition to making the task easier for the welder. The illustration shows two turn-over fixtures, both of which are revolved by power.

The giant fixture shown in Fig. 9 is one of the largest fixtures thus far built for the construction of all-welded tanks. Actually, the fixture weighs as much as a completed tank-which is 30 tons. This fixture provides for the welding of the entire tank hull, being designed so that it will grip the entire tank hull and revolve it in a complete circle so that the workmen can always weld downward, no matter on what portion of the hull they may be working. Not only does the fixture provide for revolving of the hull, but it is also designed so that it will tilt sharply lengthwise either upward or downward. All movements of the fixture and workpiece are controlled by power.

Practically the last operation in the

construction of a tank is the assembling of the tread to the wheels, or "laying the track." Laying the track for a new tank is one of the mos spectacular operations in the build ing of these 30-ton giants. The tank are assembled on a continuously-moving conveyor, the tank proper being carried on two dollies. At the fina assembly end of the conveyor there is a hydraulic lifting device built in to the floor so that the tracks can b laid directly on top of this hydrauli device and raised up in place auto matically for assembly onto the tank The end of the tread is then picket up and fed back over the top of th wheels, meshing with the sprocket by which it is controlled, and coupled in position. The tank is now complete except for what painting and other finishing it may require before being released for service.

As soon as all the mechanical details have been checked up, however the tank is started under its ow power and run out onto the proving ground where it is given a thorough test at all the various speeds within its range. If the test proves satisfactory, the tank is brought in, cleane up, painted, all bearings are again to

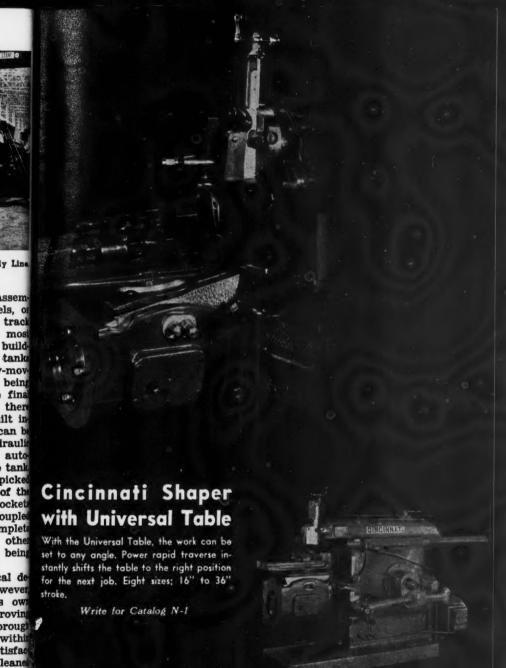
Wi

set

star

for

stro



THE CINCINNATI SHAPER CO.

ain lu

ry, 194

CINCINNATI OHIO



Fig. 11—These M-4 Tanh
Will Soon be on Their
Way to Africa, or Russia
or the South Pacific, o
Wherever They may b
Needed to Fight the Battle for Freedom and
Democracy

Tur

and the tank is given a last inspection to make sure that it is perfect in every detail before being turned over to the Army. It is now

ready to take up the task of maintaining freedom for America.

Infra-Red Drying Doubles

Production of Sand Casting Molds

sory equipment are given a final test,

Infra-red radiation has doubled production of sand casting molds by replacing the conventional flame drying at the Pittsburgh Cast Products Co., Swissvale, Pa. Using banks of six Westinghouse 250-watt R-40 bulb, drying infra-red lamps with built-in reflectors, the drying time was cut to one-third and rejects were reduced 15 per cent.



OLLET CHUCKS ODEL OF THE RODUCTION WORK

ucks. These are the "01" of greater Turret Lathes, Automatics and NEW MODEL "01"

giver adapt them for all types of equipion to improvement by Erickson Engi-

being to the now



Models 102 and 402 on Automatic Screw Machine.



Main and Auxiliary turrets equipped with Erickson Chucks.



Model 102 Chucks for drilling and tapping operations on Turret Lathe.



Special Model 202 on Hand Drill



Model 402 Chuck in use on Automatic Screw Machine.



Horizontal Miller with 102 Chuck.



Tool Post Grinder equipped with Model 301.

Foreman Training at General Electric

By WENDELL M. NELSON

Assistant to Manager, Schenectady Works, General Electric Company

WARTIME production has exerted tremendous pressure on all peace-time industries. In our warproducing program there is only one objective, more war production-and faster.

This objective has occasioned radi-

cal changes in our factories. Hard as it has been to increase plant size physically, an equally difficult task has been that of increasing plant personnel in the same proportion. As plant personnel increases and as great numbers of our men are going into the service of the Army and Navy, the degree of skill available in the new employees falls lower and lower, to a point where most are unskilled and many of these are women who are being engaged on jobs for-

merly performed by men. It is not only the training of new employees that must be considered. There is also a demand for more supervisors due to increased personnel, and it has been necessary to select as supervisors those with short periods of service and little familia ity with the problems of industry.

Management has long realized th importance of foremen training, an now with so many new employed and new supervisors with brief ser ice in industry, management realize

> that foremen training is an absolute nece par sity.

wl ly in

an dif thi me

rie inf ma oth

fac

clu

The tion lem

to

Pro

dec

tal

wou

twe

1.

2.

3.

Thus it is found the more emphasis must how placed on the trainin simi of foremen so that the are better able to trai by h and instruct the erat workers to bring the from up to the required ski that level. The foremen no depa only have to be trained the more fully, but the training must be mor of h intensive in order tated take the least possible time to develop a sa the supervisor decid isfactory

system. The foremen training which program of the General Electric Comin th pany is one of long standing. It begs in 1919 when our foremen began that practice of gathering together in smithere groups to discuss problems closely a ssar sociated with their jobs. Later, in 198 confe this program was developed to



WENDELL M. NELSON

MODERN MACHINE SHOP

124

January, 19

anuar

In

which has been carried on continuously since that time.

This later program was developed in accordance with experience gained and with changing requirements of different periods. It was divided into three steps - lectures, interdepartmental visits, and conferences.

The first of these, the lecture series, was designed to provide general information and to acquaint the foreman with some of the functions of other departments in a large manufacturing plant. Lecture subjects included: Company History and Policy, The Foreman's Place in the Organization, Employee and Personnel Problems, and the Foreman's Relationship to the Accounting, Engineering and Production Departments.

Use of these lectures prompted the decision to institute interdepartmental visits in the hope that such visits would develop closer cooperation between the foremen of the various departments. This accomplished three

objectives:

miliar

zed th

ng, an

ployed

ef ser

realize

rainin

nece

nd the

nat the

red ski

traine

stry.

1. The foreman benefited by seeing must how other departments were doing trainir similar jobs.

2. His knowledge was broadened to trai by his observation of other plant opt the rations, often on unrelated subjects. g the from which he could devise methods that could be altered to fit his own men no department.

3. He could, by suggestions, give but to ther department foremen the benefit of his experience on mutual or rebe mor lated problems.

Based on the experience gained in possible conducting the lecture method and o a sa the interdepartmental visits, it was ervisor decided to go a step further and hold series of foremen conferences

training which would include every supervisor ic Comin the plant.

It beg In line with the experienced gained gan thin the former methods, it was felt in smanner were certain fundamentals necosely a ssary to assure success of the new in 193 conference method.

to of



We are proud to announce that out of their own pockets, the employees of Universal have bought and paid for a \$50,000.00 U. S. fighter plane. And this, mind you, they have done in addition to subscribing 20% for War Bonds.

We are proud, too, of our Collet Chucks which have ground threads, ample room for tool feed-out and grip as strong as steel. Write for facts.



UNIVERSAL ENGINEERING COMPANY FRANKENMUTH.

In the first place, since company policy is developed from the experience of daily operations and reports and is the combined best judgment of all who participate in management, and since the foreman is dealing with the specific situation that reflects later in company policy, this tie-in between the foreman and management policy should be made clear and discussions led from specific matters to general policies and principles. Next, since foremen are operating men, all subjects should be discussed from the operating point of view; and finally, to obtain the maximum benefit, all grades of supervisors from the foremen to the manager must be familiar with the program.

The conference organization was under the general direction of a member of the Manager's staff whose first task consisted in training a number of carefully selected group leaders. Together they selected topics which could be used for group discussions

The conference groups were composed of supervisors from different departments, and the subjects were developed out of a variety of production problems. The result of these conferences, which allowed the supervisors to discuss common and particular problems, was reflected in greater cooperation between the foremen of various departments. Other benefits obtained from these conference groups was the elimination of the "Yes-yes" attitude on the part of the foreman because full discussion was allowed and all members of the group had an opportunity to present their own individual ideas. Since all supervisor levels were present at the conferences, foremen learned where to go to get information on a great variety of subjects.

FC

4

5

This and dela com hand with heat and to cout

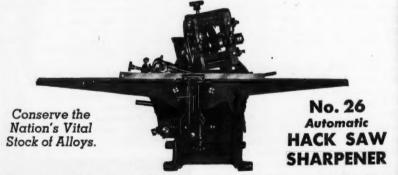
Ty

MA:

AUT

Since we wished to develop in each foreman an incentive to learn more about his job, to recognize its impor-

Hack Saw Costs Cut in Half



Ask us to explain the exclusive features that make the No. 26 a practical machine for power hack saw sharpening.

COVEL HANCHETT CO.

Big Rapids, Mich. • Portland, Ore.

ussion r beneference

of the of the on was of the present ince all at the where a great

in each n more impor

R

6 a

re.

e com ifferent s wen produc f these super partic greatoremen

NOW! FURNACE FOR **HEAT TREATING** SMALL PARTS

HERE ARE 5 OF MANY USES FOR THIS ELECTRIC FURNACE

- 1 HARDENING SMALL MACHINE PARTS Do your own heat treating-avoid delays of relying upon overcrowded commercial heat treaters.
- 2 DRAWING OR TEMPERING METAL PARTS Use it as auxiliary equipment-save expense of using large furnaces for small parts.
- 3 NORMALIZING OR ANNEALING SMALL PARTS -Handle this work easily and quickly-save time and money.
- 4 PRE-HEATING FOR HIGH-SPEED HARDENING or for use on miscellaneous small parts.
- 5 EMERGENCY REPAIR ORDERS—Use it to handle them immediately and conveniently-prevent shut-downs.

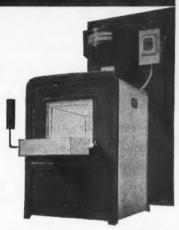
This small compact electric furnace is ideal for small tool This small compact electric furnace is ideal for small tool and die shops lacking heat-treating facilities. It prevents delays of heat treating due to over-crowded conditions in commercial heat-treating plants. It is compact, inexpensive, handy and easy to operate. Small parts can be handled without heat and power waste of a large furnace. Preheating of small high-speed tools can be handled quickly and easily. Repair parts on emergency orders can be rushed to completion in your own plant—no need to send them out for heat treating.

OFFERED IN TWO SIZES

Type	Chamber Capacity	Amps 115 V	Watts	Amps 230 V	Price
MH-3	8"W 6"H 14"L	29.6	3400	14.8	\$124.00*
MH-4	10"W 6"H 18"L		4800	20.9	\$191.00*

*Includes Cast Nickel Chromium Hearth Plate MAX. SAFE TEMPERATURE—Continuous operation, 1750° F.; Intermittent operation, 1850° F.

AUTOMATIC CONTROL—Indicating Controlling Pyrometer—Thermo-couple and lead wire complete—\$142.40.



REPLACEABLE HEATING

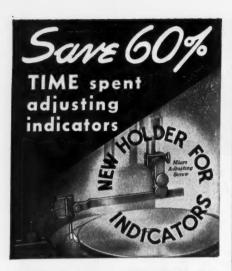
ELEMENTS Replaceable nickel chromium resistors embedded in rectangular refractory blocks. Elements form inner walls of furnace chamber, and may be replaced easily and quickly after removing rear panel-furnace structure remains undisturbed.

FREE Complete data covering speci-

fications, additional applications, and ordering instructions are included in this new folder. Write for your copy today. Ask for Bulletin No. 50.



COOLEY ELECTRIC MANUFACTURING CORP. 213 S. SENATE AVENUE INDIANAPOLIS, IND.



For Jigborers, Boring Mills, Milling Machines. It fits all popular indicators. The above illustration shown complete with extension bar.

NO more tiresome tapping your indicator into position. Now - after locking to approximate position, you obtain final setting by simply turning Micro Adjusting Screw. This exclusive, time-saving feature of the OSLUND HOLDER for all popular indicators gives you complete control. Write today for details.



tance and to discuss and suggest solutions to his problems, we caught the interest of the group at the opening session by starting on the general topic, "What is a Foreman's Job?"

Discussion on this topic generated a list of subjects all of which were covered by the selected topics previously covered by the group leaders. There was some variation in the groups-not all the same. In general, topics could be combined in the following list.

- 1. Building and Reducing the Working Force
- 2. Assigning, Instructing and Training Men
- 3. Interpretation of Union Agreements
- 4. Handling Grievances
- 5. Company Policies and Benefit Plans
- 6. Employee Rating
- 7. Safety and Housekeeping
- 8. Wage Rate Administration
- 9. Evaluating Jobs
- 10. Expense Budgets-Cost Control and Reduction
- 11. Waste and Spoilage Elimination
- 12. Production and Inventory Control

Streamlining Necessary

The war and its demand for pro files duction emphasized the need d streamlining the conference program Nich in order to furnish the new foremer to en the maximum training in the short est possible time. This meant "paring down" the time allowed on some dor w the conference subjects which wer Spec covered with less personal discussion furth therefore a program was develope There which consolidates the best points of letin, the former conferences and lectur programs.

Some of the subjects named above are now presented in lecture form while others have been continued the conference basis. By following

Lox

one

Was

mus deta

poss

To

START AIMS TO THE NEW YEAR RIGHT



REPRINTS of this and other recent "object-lesson" cartoons available for shop bulletin boards.

nation Con Loyal American industry has but one war aim: to produce to the utmost. Wasted time, effort, tools, materials must be reduced; short cuts devised; details simplified. Besides making files capable of yielding the greatest possible number of efficient strokes, ogram Nicholson has instructional material premer to enable bringing them out.

To speed filing on specific metals ome a pr work, Nicholson or Black Diamond wen Special Purpose Files constitute a ussion further important waste-saving aid. velope There is an informative Technical Bulints detin, or capable engineering counsel,

available on any special filing problem you may have.

FREE - Technical Bulletins

on Nicholson or Black Diamond Special Purpose Files for Stainless Steel, Aluminum, Brass, Lead, Plastics, Die Castings, Foundry Castings, Die Making, Lathe Filing, Shear Tooth Filing (smooth finishing on soft metals). Name ones wanted.

Ask your mill-supply house about further Nicholson helps. Or, write us direct.

NICHOLSON FILE CO., 48 ACORN STREET Providence, R. I., U. S. A.

(Also Canadian Plant, Port Hope, Ont.)

NICHOLSON FILES



ary, 19/10/ary, 1943

st soaught

opengen-

man's

erated

were

s pre-

aders

n the

gen-

in the

the

and

Agree

Benefit

r pro

ed d

short

parin

lectur

abov for ued o llowin

n contro

this procedure, it is now possible to present the material covered by these subjects in about 15 weeks at 11/2 hours per week on company time, thus allowing the new supervisor to gain rapidly a conception of his responsibilities.

Additional Course in Practical Psychology

In addition to this 15 weeks course which supplies him with general information enabling him to give instruction, the foreman is given a purchased course which runs through the rest of the year and gives him a working knowledge of the application of psychology as applied in the personal contacts between the supervisor and employee, or other supervisors.

Two duties of the foreman are stressed in this prepared course:

1. To build and maintain willing cooperation among workmen.

2. To get work done, done right A and done quickly.

These two duties emphasize importance of knowing human natu and understanding how to deal wi and influence people. Thus it shown that a foreman's job is a l man relations' job and the measur of the foreman's effectiveness depend upon his understanding of his wor men and their reactions.

It is shown to the foreman that, order to secure the second of the objectives, a high degree of effective ness must be maintained in the first The successful foreman is a lead of men.

Inasmuch as the foreman repn sents management to the worker a the worker to management, it is sential that the foreman be trained to understand the principles of h man behavior and be prepared to u proven methods in dealing with h employees. The foreman is taught!



HAND FREE OPERATION!

 Foot operation leaves BOTH hands free for fast insertion and removal of work. Vise stays open or closed without constant foot pressure.

Complete with Foot Control Valve, Air Hose and Fittings.

FAST! POWERFUL! FOOT CONTROLLED!

PROMPT DELIVERY!

 At last! A powerful pneumatic vise! a remarkably low price! Expertly eng neered, SPEEDY AIR VISE is fast in a tion, hard gripping, husky, easy to ope ate . . . just the vise you need to spee up your production. Operates from a line or individual compressor, exerting grip of 15 times air pressure. Jaw open up to 3 inches, easily fitted to hold carare you ings, parts, jigs, etc. Because of its lo mol-room cost, can be economically used on ever drill press, miller, filer and assemble Hardin

Write at Once For Circular A-Impacity

BROWN CORP., 5720 ARMITAGE AVE., CHICAGO, ILLINOIS

ERFO

righ LARDINGE SJOGREN

ze t

natu al wi it s a h

neasu depen wor

that, f tho fective ne firs lead repn ker an

t is e train of h l to u vith h ught

tly eng st in (to ope to spee from a

xerting

w open

on eve

NOIS

uary,

SPEED



COLLET CHUCKS



For CAM-LOCK SPINDLES

TAPERED KEY-DRIVE SPINDLES



For THREADED NOSE SPINDLES



old cosare you getting full value from your investment in of its longine lathes?

ssemble Hardinge-Sjogren Speed Collet Chuck gives greater ar A-lapacity, saves time, increases accuracy and assures tter results.

It is readily adapted for use on the spindle nose of your lathes, takes precision collets - enabling the operator to do better work . . . faster!

Available in three sizes: 1", 1-3/8" and 1-3/4" capacity.

Furnished with Hardinge Precision Collets.

ERFORMANCE HAS ESTABLISHED LEADERSHIP FOR



do this in all phases of his personal contact with employees, especially when adjusting grievances, training and instructing workmen, and interpreting company policies.

Women War Workers Need Special Training Technique

Today another factor enters the field of supervisor-worker relations: one which requires careful thought. This factor is the placing of women on men's jobs. Fundamentally, perhaps, the methods of dealing with women workers are similar to the methods used with men, but it has been found that there is a difference in the characteristic temperament and in reactions to certain conditions. These factors must be considered when supervising women, and care must be given to the selection of supervision and direction methods which will ensure effective training and instruction of women employed. In foremen group discussions backs up by the foreman's observations, the following characteristics have beset forth as applying particularly women workers:

They are often subject to pet jealousies; "clicky."

There is a tendency to make issue out of little things.

They hold grievances and lack se confidence and mechanical sen

They are less safety-minded the men and less able to rease through on a strictly mechanic job.

They require more detailed instrution before going on their own.

However, women are: Interested and eager to learn.

More conscientious and unwilling to take chances.

They possess greater manual de terity, show greater interest the new men, and prefer jobs who



plove back ons, ti e be arly pet e issu ck se l sen d th reas hanie instru own. TOOL CASUALTIES Slashed 70% rn. awilli al de st th whe

SUNICUT

ncreases tool life . . . saves time and labor"

duction of vital parts for tanks, tractors and "blits ggies" was hampered at this large automotive parts mt by poor tool life. Scarcity of small tools added to seriousness of the problem.

an a Doctor of Industry—a Sun Cutting Oil Engineer liled in metal working problems—was called. He fied the conditions and prescribed a change in cutg cil-to Sunicut the transparent sulphurised cutting Sunicut proved to be the right answer. The life of luable small tools was prolonged by 70% ... iewer

Jary.

"down times" for tool changes were required ... production was speeded along the line.

War plants of all kinds—with a variety of cutting oil problems—are finding Sunicut's superior metal-wetting and heat-absorbing properties the answer to their metal working problem. Call in a Sun Doctor of Industry today to study your particular operating conditions and recommend the correct grade of Sunicut to increase tool life and boost production in your plant. Write

SUN OIL COMPANY · Philadelphia Oli Company, Ltd., Cana

SUNOCO>>

PETROLEUM PRODUCTS HELPING INDUSTRY HELP AMERICA

SPEEDING up production through use of simple jig which holds tubular framework during welding operation.



assure quick, positive clamping and easy instant release. When you design fixtures for holding parts during welding, machining, reaming, inspection, drilling, assembly or similar operations always specify De-Sta-Co Toggle Clamps...built in all sizes from the small 9¼ ounce aircraft model up... every clamp carefully engineered to assure ease of operation without undue looseness.

Bulletin No. 41 illustrates many uses ... sent free, on request.

DETROIT STAMPING CO.

operations can be developed the point of automatic performance.

It is emphasized to the foreme that one of their most important responsibilities in connection with the supervision of new women workers is the training and instruction of these women to enable them to perform their particular jobs. They are shown that effective instruction is a most necessary part of successful supervision, and that care should be taken when explaining an operation so that too much is not presented at one time, otherwise making it hard for the learner to grasp all details. To be most effective, instruction should comprise a combination of explanation and demonstration. Explanation must be clear and detailed so that the learner does not have to guess a the meaning.

When training women operators, was found that the following additional suggestions to the instructor and foremen helped them to put across their message.

 Avoid using mechanical or technoad nical terms without defining explaining them.

2. Help overcome fear of the mag, chine by showing its limitations

 Emphasize that rules are mading a v to be followed, and are only de signed to protect the operator.

 Explain in detail all the factor involved in one complete operation.

I have given rather briefly an out line of the foremen training plan used now by the General Electric vy Company. Benefits received ar three-fold. One; the foremen an given information and training which LERS helps them bring their employees u to maximum production in the short est possible time. Two; satisfactor ECIA employee relations are developed. An three; safe and sanitary working con ditions are maintained.

Turl



rs, i HE right tool in the right place at the right time is a tremencton dously important item in the Battle of Production. For mainery maintenance in factories, airplane plants, shipyards, road shops, power plants, mills and mines . . for repair erations on Ships, Marine Engines, Diesels, Pumps, Generamas, Turbines or other large machines . . . OTC TOOLS are ions a vital job, and doing it well!

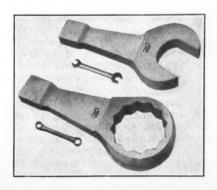
oTc TOOLS

NT SLUGGING WRENCHES Made to Specifications

tricky Duty BOX WRENCHES 24 sizes — 7/8" to 31/8"

hid LERS and PUSH PULLERS Capacities 5 to 50 Tons

tor ECIAL TOOLS to order





de r.

tor era

out

pla

ar

ort

HAVY OWATONNA TOOL COMPANY

OWATONNA, MINNESOTA

Drawing Shells Several Times Deeper Than the Press Strok Single

By using a new type of "Progressive" Power Press operation is now being successfully performed in aircraft work

> By C. W. HINMAN Designing Engineer

TNDER the pressure of war-time conditions, American engineers and manufacturers are developing many new methods of obtaining much-needed production. For example; one of the troublesome "bottlenecks" that has been holding up the production of deep drawn and formed parts for aircraft equipment is the use of thin layers of plywood under the rim of a shell in process of being drawn and formed by the use of dies set up in drop-hammer presses.

The usual procedure is to make a number of plywood panels and cut them into pieces to fit around the outside contour of the shell. In operation, the press operator begins by stacking the panels on the die in layers under the first drawn rim around the shell, piling up the layers almost as high as the dimension to which the shell is to be drawn.

One plywood layer at a time is removed, after the hammer has been raised at the conclusion of the stroke. This must be done each time, before making the next strike. By using

this slow method, in conjunction frawn a considerable amount of hand wees he the operator may finally successing the succession of the considerable amount of hand weets he had been successive. drawing the shell down the requen us depth into the die. However, All in shell is often so badly wrinkled lities damaged, as a result of attemptove i straighten it afterward by hand ned for it must be scrapped.

This tedious process is still us articul many American and European ress v craft plants, but its many faultshat wo so obvious that the need for der avoid improvements is urgent. Fromhat wo long list of disadvantages a few ood pa rawing listed, as follows:

(1) Much time is lost in maluminu the many plywood panels. (2) a sin panels soon become so badly till ret that new ones must be substituted in (3) The drawing is frequently faress. which at times results in 40 per loss in scrapped shells. (4) A With siderable amount of watchfulne intim necessary and much hand lab in the state of the s required to hammer the wrinkles the trade develop in the drawing open harles (5) In many cases as much as harles

ssive hment. Grips et so ht-Ga Courtesy

Strol with

jours ha n the p good the hould

January anuary,

1-Bliss Standard 2oh Stroke Press Equip-d with Misfeldt Pro-ressive Drawing At-chment. The Bed in the thment. The Bed in the
tess is Elevated a Small
mount During the Uptroke of the Ram. On
Down-Stroke the Bed
Locked and a Pressure Locked and a Flessure
i Grips the Aluminum
eet so that the Punch
n Continue Drawing.
tht-Gauge Aluminum ht-Gauge Aluminum ts can be Drawn to pths of 16 Inches in a Single Progressive Operation

ourtesy Hydro Appli-ance Co.)

ess ed

iours has been spent n the production of good shell, wherethe same shell hould have been ction rawn in two minand wites had properlysucceelesigned equipment e requen used.

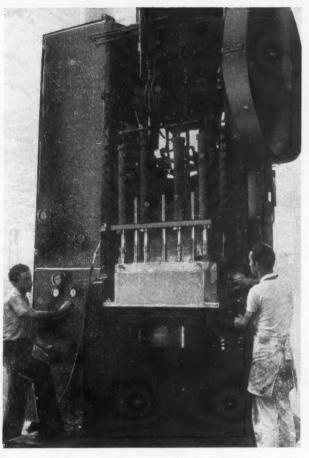
nkledulties enumerated tempibove indicated the nand, reed for more effilent equipment; ill usonrticularly a punch pean ress with features fault hat would eliminate or dra avoid these faults;

ever. All in all, the diffi-

From nat would eliminate the use of plya fewood panels; that would facilitate deep rawing operations on either steel or n maluminum alloys, progressively and (2) a single set-up, and which would dly till retain all the desirable features bstitound in the ordinary type of punch ly faress.

Progressive Power Press

) A With a background of many years labo intimate knowledge and experience ikles th the operation of all types of open ower presses of conventional design. h as harles C. Misfeldt, aircraft engi-



neering consultant of Glendale, California, made an intensive study of the features of presses best suited for the production of aircraft parts and finally succeeded in developing a "progressive power press." The press, now being manufactured in Glendale for the Hydro Appliance Company, fully meets the challenge of adverse conditions and has been welcomed by aircraft engineers as the solution to many of their troubles.

The design of the press is such that the use of plywood panels in drawing and forming operations on aircraft

per

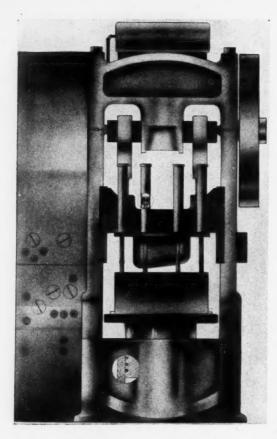


Fig. 2—Schematic Arrangeme Bolster, Hydraulic Bed, and and Blank-Holder Pressure Pad its Actuating Cylinders, in a gressive Power Press (Courlesy Hydro Appliance C

tion. Shown here is a standard punch press, whas been converted by application of a Progres Power Press unit. For purposes of simplicity in planation, however, it will easier to think of this equipment as a functional para new line of power pressure.

Progressive Power Pre

A vertical section that a Misfeldt Progressive Daing Press, in which a dipositively mounted on a tical hydraulic ram situs in the bed of the presshown in Fig. 2. The dielevated automatically small predetermined tance each time the pudescends. On the down-state ram is locked with the in position, and as a result of the progression of the proposition, and as a result of the progression of the pudescends.

at each stroke the punch enter little deeper into the die. This m ner of operation causes the works terial to be drawn slightly beyond yield point and in short progres stages of uniform depths.

However, while the operation is process, adjustments can easily made that will keep the "draw" win the range of the elastic limit the material and will thus pred the possibility of thinning the win the shell in process of draw This feature—which is eminently sirable—introduces a new print into the deep drawing of shells that the shape being drawn is estable.

parts is eliminated, and includes all the advantages and desirable features found in hydraulic, drophammer, and stretching presses. Added to this are the best features found in ordinary presses, with several new advantages.

Perhaps the first consideration is the fact that the unit can be installed in any ordinary punch press of suitable size. Thus a press of an older type can be converted into one having all the "up-to-the-minute" features required for modern aircraft manufacturing.

The illustration Fig. 1 presents a typical example of such an installa-

January,

VARD

in thr

ing plu

and m

on int

check

Trunce L-3 typ

form.

tion c

thread

VARD

in Mei

pipe th

suppli delive angem d, and Press liance C

is a l ess, w ed by rogre For city in , it wi this eo nal par

er pre er Pre n thre sive D ch a di on a m situ press

The di atically nined the pu own-str rith the s a res

enter This m work beyond rogres

ation i easily aw" w c limit s prec the W

draw nently princ shells is es

anuary,



PIPE GAGES

VARD Pipe Gages comply with American Gage Design standards and are made to Army-Navy Specifications—AN-GGG-P-363—as to type and tolerances. VARD Pipe gages may be obtained in a full range of sizes from 1/4-in. to 6-in. pipe diameters.

At left, are illustrated VARD Plain Tapered, 6-Step, Ring Gages.
All VARD Pipe Gages are made of selected tool steel, hardened, ground and finished to the speci-fied tolerances.

LOOK FOR THIS MARK



ON ALL VARD PRODUCTS!

VARD Pipe Plug Gages are made in three primary types; the L-l type, which is a single notch, working plug gage for checking the lead and minimum length of threading on internally threaded pipe. The Plain Taper Plug type, is used for checking the Minor Diameter and Truncation of internal threads. The L-3 type, is used to check the thread form, Major Diameter, and Truncation of Major Diameter internal threads.

VARD Pipe Gages can be supplied in Metric or Left Hand threads on special order. Master or Reference pipe thread gages can likewise be supplied on order, with prices and delivery dates on request.

PASADENA, CALIFORNIA, U.S.A.



MARKING

PART NUMBERS



MARKING BY ROLLING IS FAST AND ECONOMICAL.

PRESERVES DIE LIFE AND PIECE PARTS.

REQUIRES
ONLY FRACTION OF
APPLIED
PRESSURE
AS COMPARED TO
STAMPING.

QUICK SET-UPS

MODEL 25
HI-DUTY
MARKING
MACHINE

This machine operates from your plant air line, and is one of numerous models built to produce fast, neat marking on metal parts. Hi-Duty marking machines may be had for practically any marking operation, and we will be glad to make recommendations upon receipt of your inquiries. Send prints or samples of parts to be marked, showing lettering and location, also state required production.

GEO. T. SCHMIDT, Inc.

1806 BELLE PLAINE AVE. CHICAGO, ILLINOIS lished by a slight shrinking of a ton of the work material betwithe pressure plates and around punch while the punch is drawing metal into the die. A series of a progressive draws permits the moto take on its new shape with tearing or fracturing the shells.

If the work material is light go sheet, the drawing stages may only 16 inch deep. Short draws to a tendency to force the metal plastic flow and to shrink it rathan to stretch it. Under such addition the metal tends to adjust self and to "hug" the punch as sired.

When drawing heavy gauge she ach of the progressive drastages can be made deeper that inch, but at no time is it necess to stress the metal to such a pthat the shell develops the well-kn "orange-peel" appearance. This pearance on a shell indicates this walls; a common fault encound in drawing and forming work by chammer strokes and in conventionally the presses.

The Blank Holder

The illustration Fig. 2 shows schematic arrangement of the feetly-controlled blank-holder use these progressive presses. The blank-holder is attached by pistons a the pressure plate of the blank-holderiself, but is actuated and controlled by the movements of the hydram in the bed. By this simple rangement the blank-holder is alse "in touch" with the position of die, and therefore is enabled to make the pressure on the matching drawn at each stage of operation.

By using a properly-equipped gressive press, a 2-inch crank-st can be used to draw a shell depth of 16 inches. When the has been drawn to full depth.



OUICK MARKING FOR PART

NUMBERS



MARKING BY ROLLING IS FAST AND ECONOMICAL.

PRESERVES DIE LIFE AND PIECE PARTS.

REQUIRES ONLY FRAC-TION OF APPLIED **PRESSURE** AS COM-PARED TO STAMPING.

> QUICK SET-UPS

MODEL 25 HI-DUTY MARKING MACHINE

This machine operates from your plant air line, and is one of numerous models built to produce fast, neat marking on metal parts. Hi-Duty marking machines may be had for practically any marking operation, and we will be glad to make recommendations upon received your inquiries. Send tions upon receipt of your inquiries. Send prints or samples of parts to be marked, showing lettering and location, also state required production.

GEO. T. SCHMIDT, Inc.

1806 BELLE PLAINE AVE. CHICAGO, ILLINOIS

lished by a slight shrinking of a t'on of the work material bet the pressure plates and around punch while the punch is drawing metal into the die. A series of progressive draws permits the m to take on its new shape with tearing or fracturing the shells.

RTON dicating

If the work material is light g sheet, the drawing stages may only 16 inch deep. Short draws a tendency to force the metal plastic flow and to shrink it r than to stretch it. Under such a dition the metal tends to adjust self and to "hug" the punch a sired.

When drawing heavy gauge sh each of the progressive dra stages can be made deeper than inch, but at no time is it neces to stress the metal to such a that the shell develops the well-kn "orange-peel" appearance. This pearance on a shell indicates thi walls: a common fault encount in drawing and forming work by hammer strokes and in convent crank-type presses.

The Blank Holder

The illustration Fig. 2 shows schematic arrangement of the fectly-controlled blank-holder use these progressive presses. The b holder is attached by pistons the pressure plate of the blank-ho itself, but is actuated and control by the movements of the hydro ram in the bed. By this simple rangement the blank-holder is all "in touch" with the position of die, and therefore is enabled to n tain uniform pressure on the mat being drawn at each stage of operation.

By using a properly-equipped gressive press, a 2-inch crank-st can be used to draw a shell depth of 16 inches. When the has been drawn to full depth,

50TH A



same press can be used to deliver the final "shock-stroke" with the punch, working in the same manner as a drop hammer, thus producing a definite "set" in the work which establishes its final shape so that warpage will be avoided in the subsequent heat treatment.

Conclusion

Although punch presses of the ordinary type and design are widely used in the aircraft industry for the deep drawing of special steel alloys and for blanking, stamping, and shallow drawing of aluminum alloys, these presses are not suitable for deep drawing aluminum or any of its many allovs. Aluminum allovs "workharden" easily. They cannot be forced into plastic flow if drawn beyond their yield point in any one operation. If deep draws beyond the yield point are attempted without annealing, aluminum shells will fracture. However, these difficulties can

avoided by using a Misfeldt Prosive Press, for the reason that tool is designed to make possible drawing of aluminum alloys in progressive stages, without string the metal too far beyond its point. Thus the deep drawing of minum alloys in a single progre operation is made possible.

In many cases an aircraft part be drawn in a single operation by drop hammer process, or in a contional punch press if two or operations are employed and parts are annealed, pickled, washed before redrawing, but a these processes involve an untranted amount of labor, expense, delay. In addition, a great dedevelopment work in the toolrousually necessary.

On the other hand, a progre press of the type described here itself to easy and quick tooling up, and all of the several open



Yo

Per flex

tio

in '

ava

or to oil oil less mil a lin of g



Pro

that ssible in s that string of cogre

on by a con or a and kled

out a

t de

rogre here l oling opera To convey oil, steam, gas, water-

or a Voice!

You'll find a product of American Metal Hose to answer practically any requirement for flexible connections

Perhaps the most intriguing angle of flexible metal hose and tubing is its seemingly endless range of application—an unusual adaptability traceable to the variety of constructions in which we have made the product available. Using practically any workable metal, we can build flexible hose or tubing for anything from a simple oil can spout to a high pressure seamless hydraulic line that can be flexed millions of times without breaking—a line that will give you the flexibility of garden hose, the dependability of metal and the strength of rigid pipe!

Could it be that some type of this hose or tubing is the "missing link" you have been

looking for? Whether you need a flexible connector for misaligned or moving parts, for isolating vibration, for conveying air, water, oil, steam or fuel, you'll likely find we have a type of flexible metal hose or tubing that will do the job more capably.



All of our production is going to fill high priority orders, and our ability to deliver is of course limited accordingly . . . Meanwhile, do you have these fact-laden publications?

American Metal Hose

ucan metal hose branch of the american brass company • general offices: waterbury, conn. diary of Anaconde Copper Mining Co. • In Coneda: anaconda american brass ltd., New Toronto. Ontario

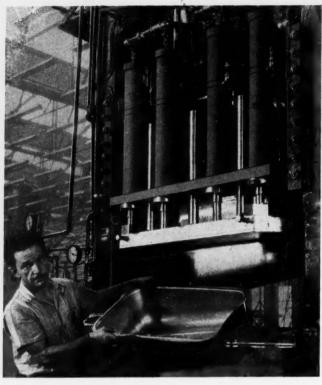


Fig. 3—Drawing tion of Oil-Tank Airplane, Usin 100-Ton Press Epped with Mist Progressive Att ment. Note Ext ment. Note Ext ment. Note Ext Ment. This O Shaped Shell with the Tank. This O Shaped Shell with the Tank This O Draw in One 1 gressive Operation Two Dies, and Mental Work, Protion Time was Hours Each. With Equipment She Production Time

PRODU

Reco

Bro

'Ame

dials

Two Minutes (Courtesy Hyd Appliance Co.

usually required for the use of other types of presses can be combined into one single progressive operation. The movement of the bed can be controlled manually as well as by the use of the cycle valve on the press; thus in either case the bed movements can be synchronized with the movements of the crank.

By using the manual control, this tool can also be converted into a hydraulic press with the features usually found in such a press. There is practically no danger of "springing" the crankshaft as a result of an incorrect die set-up; the possibility of this costly error is prevented due to the cushioned ram that supports the bed. All the controls in this press are automatic and permit the repetition

of operations occur, as a scribed about close tention from toperator.

The illustration Fig. 3 present wn" of typical one-operation progress have draw in which an experimental tank section has been produced.

In Fig. 3 a 100-ton stamping produced of standard design is shown equip deem with a Misfeldt progressive attained and set up to produce an perimental oil-tank section in a sing, gle progressive draw. The open dof is shown removing a finished half ldo is the tank from the die. If the draw ing operation were to be perform without the use of the Misfeldt tachment, a conventional press much larger capacity would be ry. quired.

Your Life Insurance won't be worth as if we lose this war. Buy Freedom Insuratoo — Victory Bonds!

Ame



MERICAN Hole Wigerd RADIALS

Marican Tool Works Co.

Concinnati, Ohio, U.S.A. Radials

h a s

Health Hazards of Artifician Abrasive Grinding Wheels

Abstract of study by Dr. W. Irving Clark, Personnel Director, The Norton Co., presented at seventh annual meeting of Industrial Hygiene Foundation, held at Mellon Institute, Pittsburgh, November 10, 1942.

RINDING wheels are very im-G portant cutting tools in modern industry. They are versatile, being capable of removing quantities of stock or of producing a mirror finish.

During the first 7 months of this year grinding wheel production was at the rate of 125,000 tons per year, an increase of 60 per cent over 1941.

Grinding wheels are used both wet and dry. When used dry a cloud of dust is produced unless the wheel is provided with a properly designed hood and exhaust. When used wet, very little dust is produced.

The abrasives in grinding wheels constitute approximately threefourths of the wheel, the bond, onefourth. The artificial abrasives in common use are aluminum oxide and silicon carbide. The bonds vary from complex silicates to organic substances. The materials ground are mostly metallic and the dust innocuous.

The reaction of lung tissue to inorganic dust depends upon the type of dust, the size of the dust particles in the air breathed and the number of particles less than ten microns in size present in the air.

The body has several barriers to the passage of dust into the lung. Those dust particles which pass these barriers are engulfed by special dust cells which slowly remove the foreign particles to the lymph vessels of the lungs. The dust particle itself provokes only a very mild reaction the neighboring tissues which rein the formation of a small am of fibrous tissue. This slight fibr does not increase.

If, through gross negligence, he clouds of fine dust have been inh over a period of many years, amount of scar tissue may be siderable, producing a real fibr reaction. Such a condition could occur unless the worker was dry grinding with no exhaust to number of years.

The study of x-ray films of lungs of human beings exposed to tificial abrasive dust have shown following: Irregular exaggeration OR TA the linear markings with posterpersome beading confined to the truin the and some increased root shad ferent Such findings while frequent am workers having an inert dust entering the form of the workers having an inert dust entering the sure are also found in persons have due to not exposure to dusts and are class, the open as being within the range of hes as being within the range of heal lungs and adnexa.

It is seldom that a worker expression of ormly control of the cont There appears to be little more the coulosis among those exposed to the ly more type of dust than in the general cone, Chi munity.

The experience of two of the est manufacturers of artificial sives in the country show that incidence of tuberculosis is app

he accu

nue, Chi

Represen nglas Hou

FOR A





mately the same as that of the pop lation of the community. In one cop pany the incidence was a trifle ke and in the other a trifle more.

The only treatment of pneumoniosis is preventive. Once the dishas lodged in the lung it cannot removed, but as pointed out its prence in most cases is harmless. It basis of prevention is removal of the dust at its source, by means of how and suction. The next best preventive is the use of respirators.

des

W

the

SUC

skil

ship

slov

sub

fan

skille

ity a

So w

Gage

United

Not o

dema

being

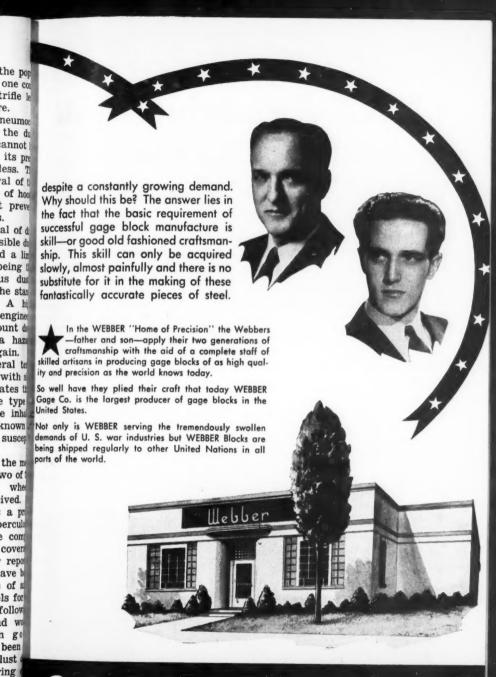
parts

There has been a great deal of d cussion as to what is permissible d tiness. Hatch has suggested a lir of 50 million particles as being tupper limit for non-siliceous durant light field technique. A his count points to a need for engine ing correction, but a low count do not mean the absence of a haz unless obtained again and again.

Pneumoconiosis is a general to that should not be confused with a cosis. Pneumoconiosis indicates to the lungs have inhaled some type dust. Silicosis refers to the inhaltion of free silica which is known be harmful and to increase susceptility to tuberculosis.

The author has written to the mical departments of twenty-two of largest users of grinding whe Eighteen replies were received. no case was pneumoconiosis a pulem and the incidence of tuberculo was low. Several insurance comnies which have extensive cover of this hazard made similar removes.

A study of 96 men who have bengaged in the manufacture of a ficial abrasive grinding wheels for years or more showed the follow results: In good health and wing — 87; pensioned but in go health—9. These men had been posed to great amounts of dust ing the years that engineering trol of the dust was being development.



GAGE COMPANY

evelo

nuary,

12899 TRISKETT RD. . CLEVELAND, OHIO

"DC" Available from "AC" Lines

Buick Aviation finds a new answer to an old problem keep

By BARTLETT WEST

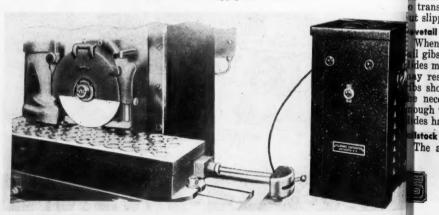
HE life-blood of American indus-Try is the electric current, commonly referred to in industrial circles as "power." Two hundred years ago the term "power" meant water-power. One hundred years ago the steam engine was in common use as a prime mover for the wheels of industry, and steam continued to be generally used until after the beginning of the present century. With the development of the electric generator, however, the use of steam began to wane and between 1900 and 1920 most of the steam plants were displaced by electric motors which draw their activating current from the wires of

commercial power companies.

cure Power of this type is, of coun y as available in two forms; direct ept i alternating current, but due to cive lor tain advantages in the application thou alternating current for the operatorized of small motors, by far the great m" number of motors used in industed fer today are of the alternating currend sho wer T type.

However, there are still cert Max types of plant equipment, such oduct magnetic chucks, magnetic inspect devices, electric cranes, and so for which direct current is necess nd ope Thus the modern plant is usually Thus the modern plant is usually All be to the necessity of installing two at the b

A Small Rectifier Supplies 110 Volts of Direct Current to the Magnetic Chuck on a Surface muse la Grinder. A.C. Supply is 440 Volts



MODERN MACHINE SHOP

January,

uary, 1

The prev

the sp

ways

nd if

nece

HOW TO GET THE MOST *nout OF YOUR LATHES*

No. 4 in a series of suggestions made by the South Bend Lathe Works in the interest of more efficient war production

olem Keep Your Lathes in Trim

The old proverb, "An ounce The old proverb, "An ounce prevention is worth a pound f coure", is as applicable to-rect the period of the period

wer Transmission

cert Maximum efficiency and

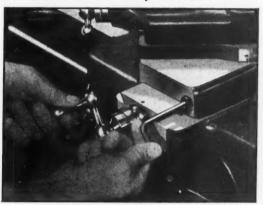
such oduction depends on the efsuch oduction depends on the efsuch oduction depends on the efctive transmission of power to the
the spindle. The lathe motor should
ways develop its full rated power
doperate at a uniform speed.
All belts must be properly adjusted.
two the belts are too loose they will slip,
und if they are too tight they will
surface susse loss of power through friction. The belts should be just tight enough o transmit the required power withut slipping.

evetall Slides

When the adjustment of the doveal gibs is neglected, looseness of the dides may cause the tool to chatter or may result in inaccurate work. The bs should be tight enough to assure necessary rigidity, but not tight ough to bind and make the dovetail des hard to operate.

Istock Adjustment

The alignment of the tailstock top



Adjust the dovetail gibs to insure accurate work

should be checked frequently as any misalignment will cause the lathe to turn a taper. Test this alignment by turning and measuring diameters on a test bar. Correct the alignment by turning the tailstock top set-over screws.

Don't Abuse the Lathe

Don't expect the lathe to stand abuse. Never use the lathe bed as an anvil or straighten shafts between centers. Never rap a file against the lathe bed or tailstock.

Write for Bulletin H 4

Bulletin H4 giving more detailed information on keeping the lathe in trim will be supplied on request. Also reprints of this and other* advertisements and bulletins in this series. State quantity wanted.

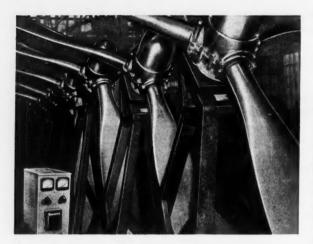
*H1, "Keep Your Lathe Clean" H2, "Oiling the Lathe"

H3, "Installation and Leveling of the Lathe"

WORKS BEND LATHE

South Bend, Ind., U. S. A.

Lathe Builders for 36 Years



Electrically-Operated Va ble Pitch Propellers are a ed on Direct Current from Mellaphone Rectifier

of wiring; the alternating current lines for the individual motors, and the direct current lines for the operation of D. C. equipment. The extra set of wiring frequently entails the erection of a direct current generating plant and its distribution system, which means a great deal of extra expense for equipment and labor, in addition to which the plant construction time is increased accordingly.

One of the great new ordnance plants completed approximately a year ago is the Melrose Park plant of the Buick Motor Company, now turning out airplane engines. Considering that the plant covers approximately 100 acres, it is interesting to note that the entire plant was built, from the ground up, in 243 days. One of the measures taken to make possible this amazing speed was the elimination of direct current wiring by the use of rectifiers which can be applied at the spot where direct current is needed. In other words, power can be taken directly from the same line that supplies current to the individual machine motors and rectified at the point of use so that direct current can be made available for magnetic chucks and other equipment

that requires din current.

Wherever direct of rent is required for operation of a piece equipment, a small to tube electronic rects is mounted directly the base of the chine, or inside the cumn, or in some of logical position where the power input to

rectifier can be taken directly in the 440-volt alternating current in which has already been wired in the main driving motor. The 110 in D.C. power output of the rectifier available from the D.C. terminals, D.C. wiring extending only from rectifier to the magnetic chuck the machine or other unit required. D.C. current.

The saving in wiring materials in time required to install D.C.

Internal and External Views of a Small Me phone Electronic Rectifier Showing Study Transformer and two 6 Ampere Half-W Tubes. This Unit Converts 440 Volts A.C. 110 Volts D.C.





Troyke Rotary Tables



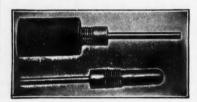
Sizes 9", 12", 15", 18"

Ask your dealer or write us for eight page catalog.

ALFRED A. TROYKE

4422 Appleton St. Cincinnati, Ohio

NEW FLEXIBLE ABRASIVE WHEEL



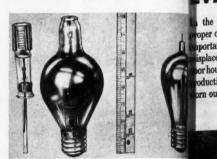
Designed for precision work. Used for removing burs, fins, tool marks on various types of production work. A very indispensable aid in speeding up production.

Write for catalog and free sample.

Field Abrasive Specialty Mfg. Co.

tribution lines was enormous, though more than 250 miles of e tric wires and cables were necess to transmit the A.C. power to machines throughout the plant, prically no D.C. wiring was necess.

Time was also saved in the deery of the equipment. A large I generating system and associations



The Heart of the Rectifier is the Mercury V Tube. Note the Heavy Sag-Proof Ca Structure. The Large Tube is Rated at II peres. The Small Tube is rated at 6 Aug

control equipment requires a control equipment requires a content of time to production while the individual electronic refier is a small unit which lends if to mass production methods.

A certain amount of saving made through the elimination of loss of voltage, which occurs in D.C. lines. Again, the individual power supply on each machine mit independent of all the rest of machines, with no chance of a line failure causing whole line machines to shut down.

Since electronic rectifiers come no moving parts, maintenance attention are reduced to the mum. The use of heavy duty in trial-type mercury vapor tubes mized tube replacements and wides high efficiency. And, last not least, confusion resulting having two different types of withroughout the plant is no longossible.

anuary,

Tool Conservation begins in the Tool Crib

A PLACE FOR EVERY TOOL.

nous.

necess er to ant, pr

the de

associa

prod

nds i

ing on of s in l

ndivi

e ma

t of

fal

lines

con

ne n y in

es

nd last

ng I

the conservation of tools, their oper care in the tool crib is just as aportant as their proper use. Tools isplaced, lost or damaged through or housekeeping methods are out of oduction just as completely as those orn out or broken on the machine.

Note the compicuous side and section of the compicu

and EVERY TOOL
IN ITS PLACE

Increased production schedules mean more calls at your tool crib windows with a probability of more delays in handling "Window Traffic". Systematic layout of aisles, shelves, drawers and compartments will assure that every tool is where you want it when you want it.

GREENFIELD TAPAND DIE CORPORATION

GREENFIELD, MASSACHUSETTS
DETROIT PLANT: \$850 Second Boulevard
WAREHOUSES in New York, Chicago and Los

In Canada, GREENFIELD TAP & DIE CORP. OF CANADA, LTD., GALT, ONT.

GREENFIELD GREENFIELD

Photo Courtesy American Booch Corp

70 Suggestions for Economy

in the operation of a machine shop under wartime conditions

By ERNEST W. FAIR

THAT can I do to help the war-WHAT can I do to her time economy and protect my own business at the same time?"

Many machine shop executives have been confronted with that question in recent weeks, so we turned it around and fired a question of our own at executives from every section of the country . . . "What are you doing about it?"

Here are their answers; answers showing all of the little and big things that plant owners and executives are doing today in order to secure more efficient and profitable operation of their shops under wartime economy restrictions.

1. Watch the use of lights most carefully and burn them only when they are absolutely needed. Wasting electricity is extremely bad when electricity itself has become such an important war element.

2. Limit or prohibit personal telephone use in the shop or in the office.

3. Take advantage of any and all discounts obtainable even to the small ones on utility bills by arranging to pay bills so that these small monthly savings can add up to large figures over the year.

4. Keep apprentices off lathes and other similar type machines no matter how necessary it may be to use them; the damage an inexperienced operator can do to a machine mno po pull it off the line for several dawaster and that just can't be done in the 14. times.

5. Don't let speed breed waste with machining operations; the amount them materials wasted through errors delimin easily offset any gain made by spec 15. ing up operations past normal point crap

6. Stretch all raw materials a more supplies to the limit by elimination over waste.

7. Don't lubricate motors and sh equipment by guess-work; institute paper, system of record cards in the shand me to ensure that each motor or machined as a second cards. will be lubricated properly and regulations, larly, and so that lubricants will haves be wasted.

8. Rebuild or refinish old or d carded equipment to see if new eculirers omies are possible by doing inside throup shop what most of us have been derials ing to the outside of the shop thing vears.

9. Check shop lighting often the sh make sure the proper light is colo fin serving eye-sight and enabling shexperi workers to keep from making cost produ mistakes and errors.

10. Maintenance men should pactual particular attention to floors, as and placement will prove costly in wa work. time. Immediate repair of any crace 19. or chips is urged. Such a policy a check

reduce 11. use of profits expert how to much pense; crease 12. fully i Hons and m

any ti up int

nged (

13. amplo

ven s 16. sed v

tion 1

January, 18 January

reduces minor accidents in the shop.

11. Institute a system of careful use of cutting oils. It may prove profitable to have one of the shop experts hold a class of instruction in how to properly use cutting oils. Too much means waste and added expense; using too little means a decrease in the life of cutting tools.

12. Check storage facilities carefully in order to make sure no conditions exist which may cause supplies and materials to spoil, become dam-

ged or be wasted.

13. Budget working time of shop employees so that none are idle at any time during the working day and ine mo portion of the payroll is thus ral day asted.

in the 14. Have useless paper stock cut up into memo pads by your printer waste with his paper cutter and scatter nount them about the shop and office to rors a liminate larger paper wastage.

y specials 15. Save even the tiniest bit of all point crap metal of any kind—not just the sals a more precious items. Before this war sation is over machine shops will be needing even scrapings and metal dust.

and shifts 16. Salvage all cartons, wrapping stitute paper, boxes, and so on from supplies he shifted and materials so that these may be machined used wherever needed in shop operated regions, thus saving original expendinges for that purpose.

or d 17. Help suppliers and manufacw en the property of the suppliers operate more economically by side the prouping orders for supplies and maeen d prials, which will in turn result in

hop savings for one's own shop.

18. Keep experimentation out of the shop; let only the men assigned is cot finding short cuts do the actual general short cuts do the actual general short cuts do the actual construction lines can aid shop operation by turning their ideas for the ld pactual experiments over to these men as and going ahead with their own many work.

crac 19. Have every piece of equipment cy alchecked once each month to head off

possible breakage of parts, thus keeping repair costs down and eliminating time lost through idle equipment.

20. Offer cash prizes or war savings stamps to employees for usable ideas that will help keep expenses down and reduce waste time or material anywhere in the shop.

21. More attention should be paid to belting and shafting than ever before; regular weekly inspection to check belt tensions and surfaces should be a war-time maintenance

rule.

22. Secure employee cooperation in reducing utility expenses. Set up monthly averages for each bill and share the savings with contributions to employee benefit funds or as war saving stamps awards to efficient employees.

23. With electric motors becoming irreplaceable, no amount of attention given their maintenance and care will be too much. It is best to have a motor mechanic inspect these motors, large and small, at least once a month and to have even the most minor repairs made immediately.

24. "Use the smaller machine whenever possible," is a slogan in use in many machine shops . . . The

resultant savings are obvious.

25. "Paint saves surfaces" . . . With that slogan in mind, regularly check shop furniture and equipment as well as the outside of the building.

26. When extra costly services are demanded on a job, see that the charges involved are passed on to the customers; under wartime operations most of them will understand why this is necessary.

27. Study closely all information relative to care and conservation of tools and equipment, and . . . pass this information along to all employees who, after all, carry out these practices.

28. Duplicate and triplicate forms may be done away with by substitut-

ing a single sheet set up in smaller type and securing a worthwhile paper saving. Such a sheet may be divided into sections which can be perforated and torn apart. Simplification of such forms will keep time required in filling them out at a minimum also.

29. Set up a system for careful control of petty cash and postage expenditures, as small leaks here can easily upset the operating balance of

the business.

30. "Since the war started I watch buying much more carefully," suggests one shop executive. "I never buy anything except urgently needed supplies at the time when approached by a salesman. It's a rule I follow religiously. During the time between his first and second calls I have plenty of opportunity to think over the advisability of the purchase under wartime economy conditions."

31. Give the utmost care and attention to typewriters and office equipment, as they cannot now be replaced. Have a mechanic check them at least once a month; it's worth the

cost-usually a small fee.

32 Check every purchase against previous orders or specifications to make sure nothing is ordered that will not be usable, thus eliminating waste through mistakes in size, type or specifications on orders.

33. Check all charity and war-benefit solicitations through your local Chamber of Commerce or Better

Business Bureau offices before m ing contributions and keep contri tions at a wartime level.

34. Use an inexpensive small h punch in office operations instead paper clips and rubber bands.

35. Fill out all government for the same day as received, advises shop executive, who cited the diffe ties he got into by holding up ad or two and then found that the val of additional forms multiplied work to be done.

36. Bundle and sell all waste par and packing cartons that cannot used in the shop. The amount ceived will cover most petty cash penditures for the average shop helps conserve these items for use through their sale to salw dealers.

37. Keep broken or worn-out a chine parts: later when parts m not be available it may be necess to repair and re-use them. In probability they will be needed trade-ins. If not, their salvage w is just that much more profit.

38. Institute safety measure Th wherever possible; the cost will bouthe profit in wartime operation for proce cidents may cause expensive and very replaceable machine damage and loss of the services of experien workers, not to speak of the cost such accidents from the human an

39. Most machine damage in with t time is caused by attempting to sary r

STONES TRUE PERFORMANCE RAFTSMANSHIP BOTH HAND PRESELECTED 6825 ADAM: NOZZLE CO. Inc. GUTTENBERG.

diff

for

the

of

TRIG-EASY NATES TRIGONOMETRY EASY MANUFACTURED BY E. H. NEEDHAM CULVER CITY CALIFORNIA, U.S.A. salw 4 ACTUAL SIZE

TRIG-EASY is pocket size. Handy. Point arrow to unknown quantity, and correct equation appears in window. Right triangle equations

fore m contri

mall h

instead ids. ent for

dvises ie diffe up a

the a tiplied aste par

cannot

nount

cash

shop a for

n-out n

arts I

necess

ı. In eeded

age va ofit.

This Amazing Chart

BREAKS THE BOTTLENECK

Machine Shop—Tool Die—Jig Bore — Patterns — Layout — Inspection — Drafting

TRIGONOMETRIC EQUATIONS are quickly found on the TRIG-EASY CHART which eliminates all errors through use of wrong equations. Angles and dimensions are determined without a knowledge of higher mathematics.

Makes TRIGONOMETRY Easy

measure TRIG-EASY CHART quickly gives will bou the answer on jobs requiring machine n for maces, holes drilled at angles, etc. On re and very job, where angles and dimensions perient of for someone to calculate how to set nan an

e in with this amazing TRIG-EASY CHART, ng to very man whose work requires a soluof problems involving angles, will his time and time for those who must t for needed calculations.

G-EASY makes Trigonometry easy

and breaks time-wasting bottlenecks. You save calculating time with instant correct equations. TRIG-EASY pays for itself in time saved, every time it is used.

Handy vest or shirt pocket size. Greaseproof and sturdy to resist moisture and dirt. Over 18,000 in use by many of the largest concerns in U. S. and Canada.

TRIG-EASY costs only 50¢ with complete instructions and MONEY-BACK GUAR-ANTEE. You can speed production thru education of personnel. Send for your TRIG-EASY CHART today.

E. H. Needham

TRIG-EASY

Dept. E.

Culver City, Calif.

QUANTITY DISCOUNTS TO INDUSTRIAL FIRMS

nuary, ory, 1943

ADAMS

NBERG.

more out of machines than they were designed to handle. This is a practice urgently to be condemned, as a machine forced out of production can accomplish far less than one operating at a moderate pace.

40. Do not use elaborate forms and routines for minor purchases or minor

record keeping in the shop.

41. Ration maintenance supplies to the individual employees responsible for their use, thus preventing waste of these supplies.

42. Inspect the shop building closely at least once a month; it is cheaper to replace two or three loose bricks or boards than to rebuild an entire wall.

43. Gear reduction units on machines should be inspected at least every six weeks, and gears showing the slightest sign of wear should be replaced; pay the utmost attention to lubrication at such times.

44. Use lighter weight paper for

printed forms, letterheads, and so the average in use in business is lbs....16 lb. can be employed in mapaper form and letterhead usage.

45. Don't let up on the person safety angle, particularly in the meter of clothing worn on the job. We so many new men and women con ing into the organization this clothing safety angle may easily be on looked with disastrous results.

46. Typewriter and adding a chine ribbons can be used longer turning them at the right time; this as soon as the original black pression begins to fade. Make a the brand now being used gives

maximum performance.

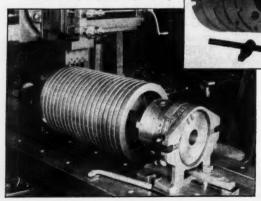
47. Cut down the use of paper office management; making car copies of answers to letters on backs of the original letters is way. It's a saving of both pand filing space.

48. Cut down on the size of

THE VERSATILE "SUPERSPACER

The HARTFORD "SUPERSPACER" can easily be set up for one piece thousands.

At right: an unconventional but simple and logical set-up for planing the graduation lines on cast iron drums... in a fraction of the time formerly required by milling.



Interchangeable mask plates ma errors impossible on divisions 2, 3, 4, 6, 8, 12 and 24.

Write for folder.

THE HARTFORD SPECIAL MACHINERY

HARTFORD

CONNECTIO

and so oness is ed in masage. e person the majob. Without this clo

y be on lts.
lding in longer time; blacking Make sigives

f paper ng car ers on ers is

ize of

CER

ates ma

RD ERY CO MANY far-sighted executives are planning now for the low-cost production of goods when post-war markets open up tomorrow.

Today, Bryant's experience in the specialized field of internal grinding is unmatched by any other organization devoted solely to internal grinding problems. Why not supplement and reinforce the skill, experience and knowledge of your own staff with the specialized training of Bryant engineers, when planning for post-war production?

Whether your problem is war production today or peacetime profits tomorrow, don't hesitate. Get off a wire to Bryant!

BRYANT CHUCKING GRINDER CO.

SPRINGFIELD, VERMONT, U. S. A.

Get off a wire to Bryant

terheads and business forms wherever it is possible to do so; short size letterheads, $8\frac{1}{2} \times 5\frac{1}{2}$ -inch, are practical for most use and represent a saving of half over the regular $8\frac{1}{2} \times 11$ -inch size letterheads. The same procedure can be applied to other forms in use throughout the shop and office.

49. Streamline your shop production; by developing better and shorter ways of moving work through the shop, many machine shop problems can be greatly simplified. Every such simplication means a certain amount of saving in overhead and production costs.

50. Watch long distance telephone usage; many times toll calls can be eliminated by the use of written message in instances where speed is not of great importance. This means a resultant saving on telephone charges and freeing long lines for war use.

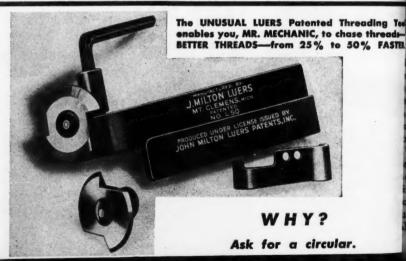
51. Assign definite responsibility

for better care of shop equipment the specific employees using the equipment. One shop owner is a ting up a bonus award for trouble free operation over six-month per ods. Placing definite responsibilities ensures that equipment will not abused and that "the little thing which lead to costly repairs will a watched more closely.

52. Educate every employee to fact that using a "little bit more" anything than is absolutely necess soon leads to waste of "an awful in

53. All projects, ideas or plans a generally unproductive natushould be sidetracked for the dution. Every operation today may a profit; there is no longer enougheft from the successful ones to profit the failures.

54. Make certain all supplies a materials are stored in the promanner; in particular, see that the are stored up, off the floor, on particular, or particula



MANUFACTURED J. MILTON LUERS

12 PINE ST.

MT. CLEMENS, MICH

Produced under License issued by John Milton Luers Patents Inc.

ter j d of dabl chine

ans in adjum 150 ced w

e st



ir operated equipment often does a ster job at reduced pressures, insad of full line pressure. Using a dedable pressure regulator for each chine gives you the most efficient king pressure for each job, availate at a turn of the adjusting screw. The exclusive piston-type design of mnifin Pressure Regulating Valves ans sensitive, accurate control, the adjustment over the entire range on 150 lbs. down, to furnish any resed working pressure desired. Long we stem travel gives large volu-

metric capacity, responding to varying operating needs with minimum restriction to flow. The wide range of adjustment makes this valve adaptable to many different service needs.

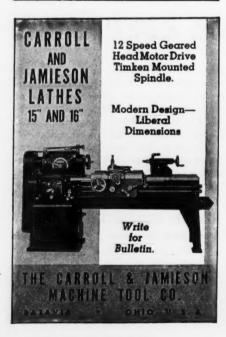
Built in three standard sizes—\(^3\), \(^1\)2, \(^3\)4 inch, for use with initial compressed air pressures up to 150 lbs. Furnished complete with pressure gauge. Write for Bulletin 56-MM.

HANNIFIN MANUFACTURING COMPANY

621-631 South Kolmar Avenue • Chicago, Illinois

MICH ANNIFIN pressure VALVES





forms or boards. Parts piled on floor damage the floor and can easily be moved.

55. Make it a shop rule to .
"Think before you throw it aw so many more materials have sain to value during wartime than dur peace time—salvage value in the itself and for sale to outside firms ones

56. Be sure to cover with greany machinery or equipment shaway "for the duration" and see in a place where plenty of air, little sunlight, can reach it.

57. "Have substitute plans pieces of critical equipment real is one shop executive's advice. the war progresses we are apply have to learn to do without some our equipment... now is the to figure out how we are going to our work if any given piece of earn to breaks down. If such plans figured out now they will be refor instant use should such an engency occur."

58. Cooperate with other all whenever and wherever possible wartime is no time for anything

cooperation.

59. Get rid of the dark corner the shop... there is where mist are made and accidents happen where the cost of operation als cilmbs; it's cheaper in wartime to more electricity than to take to from errors as well as accidents

60. Keep all machines clean free of oil and grease . . . dust dirt collected thereon are almost deadly as acids eating away at surfaces.

61. Keep all shop windows cleanave them cleaned every day. cleaner this glass is the more can get in, and the less the elabilis will be.

62. When tools are returned tool cribs have them inspected they are put away, even if it the full time of one man working

we salv Hodern inspection by optical rojection saves time and money

ed on nd car

n du

n the

firms

th gre

ent sto and se

f air, lans it rea vice. re apt t some

the oing to of eq

plans be re

an er

her a

ssible thing corner mist appen on al ime to ake l dents. clean dust almo y at

s cles day. nore ne el

ned ted l f it orkin

nes & Lamson Comparators are available n Pedestal, Bench and other types to meet very need in the field of Inspection by Optial Projection. We shall be pleased to study your problems and apply to them the accumulated experience of more than twenty years in this field.

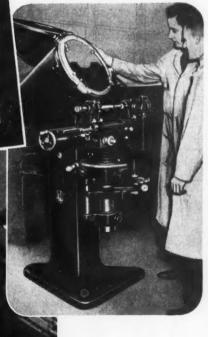


Profit-Producing Machine Tools

JONES & LAMSON COMPANY SPRINGFIELD, VERMONT, U.S.A.

Mosulacturers of: Ram and Saddle Type Universal Turret Lathes *
For Automatic Lathes * Automatic Thread Grinders * Optical Comparators * Automatic Opening Threading Dies and Chasers.







H

Photo Courtesy International Business Machines

specting tools and keeping them in usable shape. Endeavor to remedy tool faults before they occur rather than to repair them afterwards; it is a much less expensive procedure.

63. Considerable attention should be given to heating equipment. Particular attention should be given to thermostats, for if they are operating correctly, heating costs can be kept down and efficiency of workers in the shop maintained at the highest level.

64. Don't substitute oils and lubricants . . . use only the grade of oil specifically recommended for each type of machine in the shop; substitution is dangerous at any time.

65 Eliminate the use of shop equipment by employees for personal purposes . . . pre-war leniency has no place in wartime operations.

66. The problem developed by continuous changes in personnel will be with us for the duration of the war.

When hiring new employees it will good practice to give the utmost tention toward making replacement with people far removed from draft and who seem likely to be to resist the temptation to might oother jobs. As the war continuous employee problem will become more and more importance, and more given serious thought.

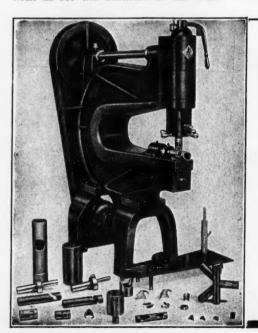
67. Keeping the floor around chines clear of waste and shaw will help cut down those minor expensive little accidents caused

slips and falls.

68. Don't depend on any one for any task in the shop . . . I someone else trained to move outhe vacant spot whenever any individual is not able to be on job.

69. Cut out all frills, decor touches and unnecessary opera in any part of the business se

70. Read and study every issu



For FAST and SAFE cutting of she metal, duplicating parts, and to relieve other machine tools, investigate the

SAVAGE NIBBLING MACHIN

TUBE SLOTTING AND TUBE SHAPIN
For cutting flat sheets by templet
or to a scribed line.

Cutting Capacities
Flat Sheets Mild Steel 3/4"
Tough Alloys 3/6"
Tubina

Wall thickness to 18"
1" I.D. to 36" O.D.

The Fastest Method of Tube Slotting and Shaping by Guide Template.

Ask for BULLETIN "G"

Manufactured by

W. J. SAVAGE COMPANY

Since 1885

KNOXVILLE TENNESS
Pioneer Manufacturers of Nibbling Machine

COUNTS FOR MORE fces in the Ho THAT'S WHAT INDUSTRY CALLS THESE TWO SKILDRILLS! Here is industry's unbeatable pair of production drills-you'll find these two SKILDRILLS in aircraft, tank and war material plants everywhere! 1/4 in. SKILDRILL handles like pointing a finger . . . gets in anywhere a fist will fit . . . provides

in. SKKBRILL. Only 6½ in. long; 2 9/16 in. wide. Weight 2½ lb. 100% Anti-Friction Bearing Construction. Available speeds (No-Load), 1800, 2500, 3000, 5000 R.P. M.

in. SKLBRILL. Only 11½ in. leng; 3½ in. wide. Weighs or b. Advanced streamlined design for perfect balance ar liest hendling. 100%. Anti-Friction Bearing Constructio

easiest, top-speed, day-long drilling on stepped-up assembly lines. 1/2 in. SKILDRILL packs more power into less weight and space than any other drill made . . . punches more holes in less time even in closest quarters. It's no wonder SKILDRILLS are known as the outstanding values of the whole drill field! SKILDRILLS are typical of

the entire line of SKILSAW DRILLS. 23 Powerful Models-a size and type for every drilling job. Ask your distributor for a demonstration.

SKILSAW, INC., 5037 Elston Ave., Chicago

New York - Boston - Buffale - Philadelphia - Cleveland - Detroit Indianapolis - St. Louis - Kanzas City - Allanta - New Orlean₅ Dallas - Los Angeles - Dakland - Portland - Seattle - Toronto, Con.

23 POWERFUL MODELS OF SKILSAW DRILLS A TYPE AND SIZE FOR EVERY

EVERY MAN

USING SKILSAW TOOLS

DRILLING JOB!

nuary, nuary, 1943

s it will utmost olaceme

from to be a

o mig contin

become and m cound :

Shavi minor

caused one

ve ove any be on decon opera

SS S

y iss

of should be

ACHIN

SHAPIN

temple

1/4"

Slotting

mplate.

ANY NESS Aachin

your trade journals; clip items that feature economy and post them on a bulletin board for every employee to read. Too few shop executives see that these ideas are passed along to employees and impressed upon them as MUSTS. An idea that has proved profitable in one shop may be found equally in other shops . . . and the employee is the individual who must. in the final steps, actually put the idea into practical use.

Machines Curved Around the Earth

When Ford engineers at Dearborn, Mich., tackled the job of designing four huge machines to grind and polish plate glass for Ford and Lincoln safety glass, they soon discovered that they were going to have to allow for the curvature of the earth of the 600-foot machines. Otherwise the glass which is handled in 141-inch lengths would not be uniform in thickness. Curvatun one-fortieth inch each way from the ters of the gargantuan tools.—Busin Week.

A Soldier's Pledge

On the fly-leaf of a diary found of young American soldier killed at 0 teau-Thierry in the First World War notation was found:

"America must win this war. Th fore, I will work; I will save; I will so fice; I will endure; I will fight cheen and do my utmost as if the issue of whole struggle depended on me da We

That pledge should be taken by e war production worker. Let not even American soldier's life be sacrificed cause someone loafed on the job laid off because he "didn't feel well" wanted to go hunting or fishing. man is a fool who will endanger life of his son or his neighbor's son personal convenience: that man is a of criminal negligence who will en ger his own and his neighbor's lib certa for temporary pleasure.

lutio

and

dian



As a Direct Hit on An Aircraft Carrier

We have fixed our sights. Our entire set-up is revolutionized. Now we concentrate on Mounted Wheels job and Vitrified Grinding Wheels 3" and under in diameter — 24 hours a day, every day.

Our central location makes speedy deliveries l en certain.



vatun the -Busin

and a at 0 Wor

r. Th

vill so heer ue of

by e

even ficed

well'

ng. nger S SON

is g

lls.

CO HIC:

uary.

- Wheels flow off our production lines and into your plant in a swift, steady stream. Speed assured on all orders. Count on us to meet bottleneck emergencies.
- Valuable man hours saved in your plant. There is no waiting for wheels.
- Customers—new wartime and old get the same high quality that has been maintained since we introduced the first Mounted Wheels 45 years ago. We can take care of all your requirements for wheels 3" and under.

You should have our new catalog which illustrates in actual colors and sizes the largest line of Mounted Wheels made. Send for copy today.

101 W. Monroe St. Distributors: Canadian Trade Corp., Ltd. 1332 Williams St., Montreal MM-1

Please send copy of your new catalog.



Drill Fixture Saves One Day Per Week

By C. P. FISHER

FROM 24 to 32 hours per week are being saved on the drilling of marine gear casings at one of the General Electric Company's major works by the use of a universal indexing trunnion fixture which permits the positioning of the casings for drilling at any angle in a full circle and in any plane.

Some 110 holes must be drilled and

tapped or spot-faced in each of castings, which vary in weight 1,000 to 2,000 pounds each. Be the trunnion fixture was developed crane had to be summoned to position the casing after the driven had been completed on each sum which meant that each piece of whad to be set up at least six in

Now the work is set up just on a table that can be revolved degrees in either direction with more effort than is required to a revolving door. With the blocked in the desired position, the

ing can be elecally rotated over end to pose any po of its sides or tom to the the rotat mechanism controlled push button.

The table mounted of frame susper on two hori tal pivots

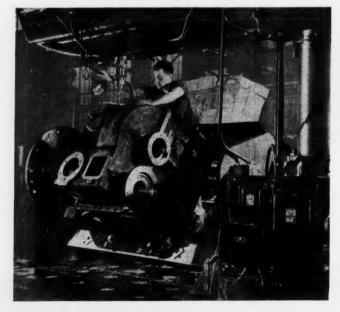
Above

d to
d pos
or lat
n the
t side
four

ed an

h the

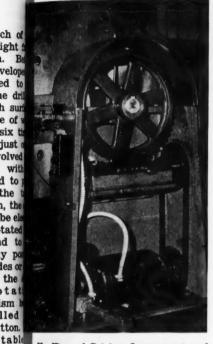
r the



Drilling a Marine Casing Tilted at Degree Angle. Driven Trunnia Indexing Plate at the Left End at Work

January, Noary, 194

nions. One of the trunnions is n-driven through a worm gear ngement, power being supplied % h.p. motor. A circular indexplate having 18 holes around its phery is mounted on the driving to afford quick selection of any he various angles called for by specifications, and a stud is pro-



e-Up View of Driving Arrangement and lar Indexing Plate. The Locking Stud is Above and to the Left of the Push Button Control

ed to lock the fixture in the de-

For lateral rotation the table must in the flat position with the work at side up. The clamping bolts at four corners of the table are rered and, by turning a lever underth the fixture, the operator raises revolving table just enough to or the frame. The table can then



over, their sharp, free-cutting action eliminates lapping and the usual semi-finish arinding operation. Catalog on request.

Prompt deliveries

New York
N. Y.

N. Y.

SONS

R. SONS

N. Y.

the

ted suspen

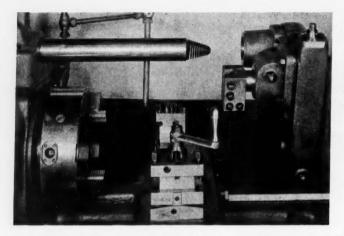
hori

vots

Marine

ted at ngle.

unnion Plate s End of ork



Spring Salety D for Use on Over Support Bar on Lathe To Preve jury to Operator gers. Develop Alfred Herbert Coventry, Engli Firm for Univer

be turned easily by hand and relocked in any position.

The table also serves as a drill jigplate for the base of the casting, eliminating the need for an extra plate.

Safety Device for Turret Lathes

T occasionally happens that the operator of a turret lathe or automatic chucking machine rests his hand on the overhead support bar, or perhaps over the guide bushing, while the automatic feed is engaged, with the result that a finger may become trapped between the end of the bar and the bushing. There have been

cases where this has caused se Establis injury, and sometimes the loss and size finger.

To prevent such accidents in past it has been the practice to check a rubber buffer on the end of the the whe the flexibility of the rubber making possible for the operator to with his fingers before they could be jured. Owing to the shortage of ber, however, it became necessar r allov find a substitute for the buffer. A some experimentation it was for that a conical spring, such as shown in the illustration, was equiputweig effective, and spring safety but are now standard on all mach made by Alfred Herbert, Ltd., It is ord entry, England.

Alfred Herbert, Ltd. feel that onal snap

aving a ess. IMPROVED LAY_OUT D upreme DEFINED SCRIBED LINES for TOOL, DIE, PATTERN, ONE QUART ... effie OR TEMPLATE ONE GALLON . LAYOUT ON METAL FIVE GALLONS autho

COMPAN MICHIGAN CHROME 8 CHEMICAL 6350 East Jefferson Detroit, Michige

n final

rumen

is esta

nan fa

gaging

pection

stions Dim

Suggestions for MORE EFFECTIVE INSPECTION PRACTICE

ed se stablish a definite wear allowance for all loss dize gages, plugs, rings, etc.

Prov

perator

withd

machi

td., (

vary,

s in ce to Check these gages periodically to deterthe the when wear has eliminated this allownakin

d be in final inspection it is better to use an n mai inspection it is better to use an rument than a fixed size gage when the ersar allowance of the gage by the 5-10% as folle is established at .0001" or less. Here the as man factor is usually important enough s equ outweigh the effect of the wear allowance bund gaging results become questionable.

It is ordinarily not best to use a conventhat onal snap gage for the inspection of work aving a manufacturing tolerance of .002"

Keep plugs and rings oiled when not

RT... effield Engineers

· In authorities on precision pection. Get their advice on stions relative to gaging Dimensional Control.

6 Be sure that both work and gage are clean before they are brought together.

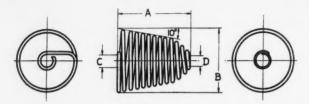
7 Periodically check your precision gage blocks for wear, against a set of certified blocks. Redesignate them when wear is revealed.

8 In setting a comparator gage be sure that both gage and precision blocks are at the same temperature.

9 It is well to check the calibration of indicating type comparators periodically. If an error is found, it is better to send the comparator back to the factory for recalibration.

10 If you are using Multichek gages insist on the operators handling them smoothly. Work should never be jammed violently into gaging position.

SHEFFIELD ORPORATION DAYTON BHID H. S.



Drawing of Spring But Turret Lathe Overha Support Bar

the general interest of safety to machine operators this device should be widely known and freely adopted. They therefore give notice that anyone who wishes to make use of this device may do so.

Samina	Buffor	Dimensions	

Dia. of Bar	A	В	C(min.)	D(min.)
11/4	1%	14	A	3/4
11/4	1 18	11/8	11	Te
15%	1%	11/2	11	re
1%	1%	15%	33	Te.
21/8	21/4	118	33	Te.
21/2	2%	25	31	A.
31/4	3%	318	32	30

Light Minimizes Change of Error

HE possibility of error in sion lathe work requiring curacy of 0.00005 of an inch has minimized as the result of a light indicating method develop M. M. Cunningham, a foreme General Electric's Schenect Works. The method eliminate human element inherent in the practice of using a magnifying to see when the tool makes co with the surface to be cut.

In Cunningham's method, elect

This OOL POST TURRET

Will Pay For Itself Quickly

Check these features-positive locking device—quickly and accurately indexed — has cutting off tool-hardened steel parts. To save time and money have a Colwell Turret on the job.

Send for new folder, gives sizes and specifications.



S. G. COLWELL 25 Congress Ave. Prov. R.I. in the palm of a hand



nand

in page and has fapeloperement ections the ving page control of the vin

nuary.



There are—to be exact—6408 accurately ground and sharp cutting edges on that particular Michigan rotary gear finishing cutter (*). Each cutting edge acts like a separate cutting tool and does its own share of the work in finish-machining gears.

That's one reason why you can produce gears so accurately and so fast on Michigan Crossed-Axis gear finishing equipment. It makes no difference either, whether your gears are 1/4 inch in diameter or stand many feet high: there is a Michigan Gear finisher for every size class.

* The illustration shows an average cutter (64-pitch; 10° belix angle) for the new Michigan 861 light duty gear finisher (see small cut), designed for gears from ¼ to 4 inches in diameter.

MICHIGAN TOOL COMPANY
7171 E. McNICHOLS ROAD DETROIT, U. S. A.

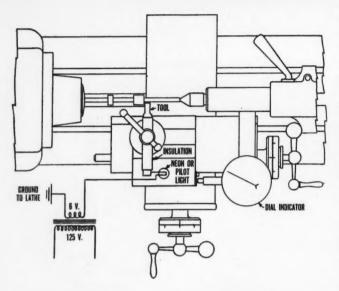


Diagram Illustrating Use of Pilot Light to Indicate Contact of Lathe Tool with Work

contact between tool and work is used to close a light circuit, telling the operator exactly when to set the dial indicator at zero, and thus establishing a sure basis for making a cut within the required accuracy of 0.00005 inch.

The tool is brought up to the surface to be cut in the regular manner until it is just about to make contact. From this point on it is brought

up very sh until the light flick Very little fur movement is quired until light is ste When it is, indicator is s zero. A cut of desired thick can then be n with the accur of the cut dep ent only on accuracy of indicator and reading. If is set and correctly, the can be no em

Either an candescent neon indica lamp can used for pilot light.

small transformer is used to re the standard 110-volt circuit volts for the detecting circuit. line from the transformer is nected to the bed of the lathe. the other line to the screw she the light socket. The center tact of the light socket is conne to a metal strip which makes con with the lathe tool, being set an the tool when it is locked in the

Convert Your Engine Lathes to Semi-Automatic Turret Lathes w

6-TOOL TURRET HEAD . . . uses 15" tool bits. Fits most 9" to 12" swing lathes. 8-TOOL TURRET HEAD . . uses %" tool bits. For lathes of 12" swing or more.

Indexing requires about one second. Simply release locking pin with lever and turn turret to next cutting position.

Tool bits are independently adjustable for height.

Write for Illustrated folder and prices. MASTER MACHINE COMPANY, 19



An Introduction To Increased Producti Grove St., Stamford, Col

MODERN MACHINE SHOP

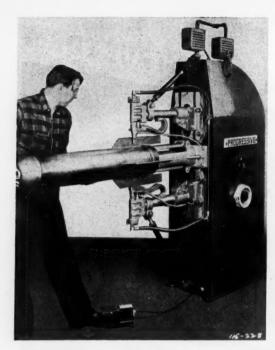
onuary, 1 January,



anuary, 1943

MODERN MACHINE SHOP

185



The Fins are Stitched Onto @ Parachute Flares by the Use Progressive Spot Welder Equip with Two Guns

"Stitching" Fins to Parachute Flares

RA

COM

STANE

ades,

met C

et a n

aterials ecial jo

MILLE

amet C I grindi

shape

tainab

ape of amet C

brazed in

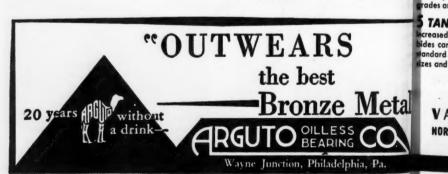
ady to

TOUSINGS for the arm giant parachute fi now have their fins "stitch on by rows of spot welds shown in the accompany photograph. The mach mody to consists of a Standard gressive pedestal well equipped with two guns chining s upper and a lower, instead the usual single gun. center electrode is fixed serves as a mandrel for g ing the housing. The local fixture for keeping the

correctly aligned were removed, i to show the guns, etc. The open 17001 merely pushes the housing along tween welds, the machine autom cally repeating the welding open as long as the foot switch is Both guns weld simus BLANK neously, only one timer therefore of ony she ing required. The machine, how bols Alo is equipped with two pressure in and any

post. The tool is insulated from the tool post with a piece of varnished cambric or light cardboard.

This pilot-light indicating method can also be used where the work is stationary, such as on milling machines, by insulating the work from the machine and connecting the center contact of the light socket to the work.



A SIMPLE WAYS TO GET **LONGER LIFE FROM YOUR** CEMENTED CARBIDE TOOLS

RAMET "5 METHOD" COMPLETE TOOL SERVICE

Use

ns to ares

e am

te fi

stitch

welds

un. 1 fixed

red. h

utom

h is

npany STANDARD TOOLS are complete tools, mach mady to use, in a choice of 10 styles, 3 ard P oracles, and many sizes—164 tools in all.

are to a majority of requirements for mawell meet a majority of requirements for ma-guns, mining steel, cast iron, and all other insteam aterials, and are readily adaptable to un. secial jobs.

MILLED AND BRAZED TOOLS have a for g met Carbide Blank brazed in place. local all grinding is done by customer. Any size shape of shank or grade of blank is tainable in this classification.

TOOLS TO ORDER cover any style or long lape of tool made to customer's order. opers arazed in position and tool finished ground addy to use.

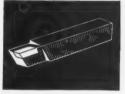
simu BLANKS OF RAMET Cemented Carbide efore of any shape, grade, or style all obtain-ble for the customer to make his own bols. A large variety of sizes in two styles and any of the three general purpose rades are available as standard blanks.

> 5 TANTUNG offers the ultimate in creased production where cemented carbides cannot be used. It is available as standard tools in a wide assortment of sizes and styles.

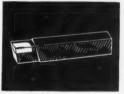
IF YOU FOLLOW THESE FOUR SIMPLE METHODS IN CARING FOR YOUR CEMENTED CARBIDE TOOLS, YOU WILL GET FASTER PRODUC-TION, GREATER PRECISION AND LONGER LIFE FROM EACH TOOL



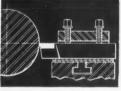
CRITICAL SPEED - The critical speed is an important factor in carbide tool life. Best results are obtained by running as close as possible to the critical speed.



CLEARANCE ANGLES - Use the minimum clearance angles required for the job. Unnecessarily large clearance angles prevent adequate support for the carbide tip.



SHARPENING — Tools should be reground at regular intervals, which are predetermined by careful tally of pieces per grind. Dull carbide tools are likely to chip, requiring extra grinding and excessive loss of tip material.



100L POSITION -As a rule the tool should be adjusted to the center. Support rigidly on a flat, solid surface, with minimum overhang.

JUMBO WALL SIZE POSTER SENT ON REQUEST A reproduction of the above instructions, four feet high, without advertising, suitable for display on the walls of your tool room will be sent on request, without cost.

VASCOLOY- RXX ME CORPORATION

NORTH CHICAGO, ILLINOIS . DISTRICT SALES AND SERVICE IN PRINCIPAL CITIES

IN CANADA: Carbide Tool & Die Company, Ltd., Hamilton, Ont.

432

TANTALUM-TUNGSTEN CARBIDE



Laboratory Technician Unit a G-E Thickness Gage
Measure the Thickness of Bearing Surface

locking pressure switches to make sure that one gun does not weld without the other one. About 18 welds are required for each pair of fins welded simultaneously, or a total of 36 welds for each housing. The end ring is also spot welded to the main housing, using the same machine.

Portable Electric Gages Speed Production

PORTABLE electric gages which speedily check the thickness of surface coatings of precision-ma-

chined plane and taparts are helping speed war products according to H. Kuehni, gage expert the General Electrompany's general egineering laboratory

"Precious time a vital materials are in ing saved in war p duction, thanks to i development years a

of electric gages for measuring thicknesses of paint on such or sumer products as automobile bod and refrigerator cabinets." It Kuehni said. "Right now manufurers of tank and aircraft engineers are relying on such gages checking the thicknesses of suffinishes, but in the post-war per industry in general can be expect to adopt them even more extensive

To prevent corrosion and to crease wearing qualities, steel beings going into plane and tank gines are lined with lead-bronze, oper, silver or heavy babbitt who ther steel parts often are plat



cian Usi Gage kness d face

and tai lping oductio o H. expert Elect neral e ratory.

ime a are l war p s to t ears a ring t ich co le bod s."

manuf t engi rages surf r per

exped ensive d to eel bu tank e

nze, a itt wh e plat

RDS NETS SES

XES

NOIS

nuary, January, 1943



SPECIAL T. HANDLE STYLES WITH MAXIMUM CAPACITIES FROM 100 TO 7200 INCH LBS.

FRICTION

ADJUSTMENTS

MOVING PARTS

Recommended for capacities in foot lbs. from 0 to 100, gradu-ated in steps of 5 foot lbs.

Other sizes shown range in maximum capacities from 25 to 600 foot lbs., and from 25 to 7200 inch lbs. When ordering state capacity needed.

oneer Manufacturers of Accurate Measurina Wrenches Sturtevant / ADDISON QUALITY

MODERN MACHINE SHOP

189



Close-Up View Showing G-E Thickness Gage Being Applied to Inner Surface of Aircraft Bearing to Measure Thickness of Bearing Surface

with chrome, nickel or cadmium. The thickness of lining or plating must be accurate to a thousandth of an inch and can be measured by the electric gage.

Until a few years ago such parts were checked by complex processes which involved selecting a few at random as they came off the asserbly line and cutting them open. Generally the thickness of plating on part was checked by measurement under a microscope. In another metod, wall thickness was measured fore and after the lining was removed, the difference between the temperature of the lining.

Today, however, the portable entric gage measures the thickness lining or plating without marring a of the parts, thereby saving time a materials. The main part of the gais a seven-pound portable indicate unit with a dial marked off in the sandths of an inch. A small cylindrical gage head containing an entro-magnet is connected to the incating unit by a lightweight call. The instrument is plugged into ordinary alternating current outst

When placed against a surface, t gage head can measure the thicker of any nonmagnetic layer up to

A MACHINE TOOL IS The Drive to Greater Production

AS NEW AS ITS DRIVE

OUTPUT—not age—is the measure of value of machine tools

OUTPUT—not age—is the measure of value of machine tools today. But full output is impossible without a modern, close connected, unit drive. Motorize now, not merely for more production but maximum production. Get a Berkeley—the drive that's built for today's deeper cuts at higher speeds. The Berkeley engineered welded steel bracket makes it the simplest of installations. They fit — every time! Let us tell you why.

Lathes, Shapers, Planers, Milling Machines, Punch or Drill Presses, Grinders of All Types, Any Ma-

ANY 1024 BAHLS AVE.
DANVILLE, ILL.
Write for Bulletin

POWER Drives

ELT • HELICAL GEAR • TRANSMISSION

A

ELT • HELICAL GEAR

BERKELEY EQUIPMENT COMPANY



Eage

up gri

ess cos

'Silver sults ta

users h

lating :

They so longer, up to 1

abrasiv

ferent

are AP

for eve

ing. W

That's l

Streak"

toughe

Writet

507 Pea

Mak



a.ssen c on rema

meti red h

remo ie to thie

e ele 1088

ng a ne a

e gu icath 1 tha cyli

n ela e ini cabi nto i outlet

ce.

to I

A leading furnace manufacturer says:

"Following a test, we now use 'SILVER STREAK' DISCS EXCLUSIVELY for grinding welds and smoothing seams"

Eager, as no doubt you are, to speed up grinding and get better results at ckne ess cost, this company ran a test on 'Silver Streak" Abrasive Discs. Results tallied exactly with what other users have found. AP's exclusive insulating process makes "Silver Streak" Discs cut faster, more uniformly. They stay sharp, cool, and on the job longer, even when temperatures go up to 1700°... a killing heat for many abrasives!

Make a test! Try this radically different abrasive on your jobs. There are AP abrasive cloths, belts and discs for every type of grinding and finishing. We'll supply samples FREE. That's how confident we are of "Silver Streak" performance. Tell us your toughest abrasive-using problem. Write today! Abrasive Products, Inc., 507 Pearl St., South Braintree, Mass.





JEWEL EMERY . JEWEL GARNET



ODUCTS

of an inch thick and backed by steel. The head sets up electric currents in the instrument which vary in intensity with different layer thicknesses. By measuring the currents, therefore, the instrument can indicate the exact thickness on a dial large enough to be read at a glance at production line speed.

The portable electric thickness gage was developed originally to measure the thickness of paints. The gage can also measure the thickness of sheets of glass, or mica, provided they are placed on steel tables or otherwise backed by steel at the point of measurement.

A different type of gage has been developed for measuring the thickness of nonmagnetic metal sheets and plates such as aluminum, copper, brass, and bronze. This type of gage is used to check the wall thickness of magnesium and aluminum alloy castings as they roll off the

assembly lines in mass quantity and no steel backing is necessary.

Automatic Temperature Control for Pot-Type Furnace

AN automatic temperature cylor program control application salt bath heat treatment, and type furnace or a processing ket incorporating excess temperate shut-off and combustion explosion protection, is illustrated in the a companying schematic drawing pared by engineers of Wheelco Insuments Co., Harrison and Peoria & Chicago.

The instrument installation is signed to control fuel so as automically (1) to provide the desired to perature at any period in the press regardless of temperature variations.



est accuracy in surface plates, reorder many times.

SMITH TOOL & ENGINEERING CO., 812 N. Wingert St., Bucyrus, O.

Precision Measuring Equipment

Write for new descriptive literature.

lonuary,

36 x 68

48 x 96

48 x 120

18 x 24

24×24

20×30

Other sizes made to order PROMPT DELIVERY ON STANDARD SIZES

antiti

ture pe

re cy plicati t, a po g ket peratu explosi the a ing po Inst

n is a utoma red to he prore vari

ith TER ICE

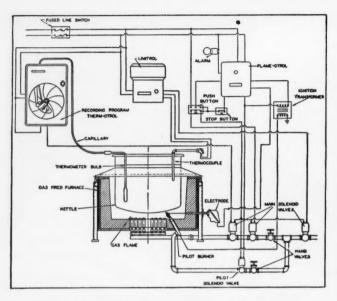
× 68 × 96 × 120

IVERY SIZES





Write to SOSSNER, 221 Centre Street, N. Y., or 29 Broadway, Lynbrook, N. Y.



Drawing Showing Arrangement of Automatic Temperature
Control for Pot-Type Furnace

tions required, (2) to provide a record of temperatures experienced during the cycle, (3) to provide excess temperature shut-off protection and protection against burning materials with low flash points, or in the event of fuel valve or instrument failure, and (4) to eliminate combustion hazards. It may be applied to gas- or oil-fired equipment.

Enforcement of any desired heating or cooling cycle, over any time

period, is achiew by a Wheelco R cording Progra Therm - otrol. transparent r tating disc, co toured so as I change the pos tion of the ten perature contri index as it n tates, effects pr gram or cvel control. An inde arm, with a small wheel riding a the outside ed of the dist changes the ca trol setting | produce the had ing or cooling a cle called for the rotating di This transpare disc is mount

directly over the chart of the record instrument. One motor and drive available for any time period, rotal both chart and disc.

The thermometer bulb of the R cording Program Therm-otrol is so pended in the furnace or kettl When the Therm-otrol calls for he a solenoid valve, shown schematical in the main fuel line just before the main burner, releases fuel that is nited by a continuous pilot burne

N means "ACCURATE MARKING"

and the ACROMARKER is only one of the FAST but simple machines our skilled workmen build for marking.

This machine is provided in several sizes and special fixtures are made for special work.

Send us your marking problem—Priority deliveries are FAST.

WRITE FOR CATALOG No. 52.

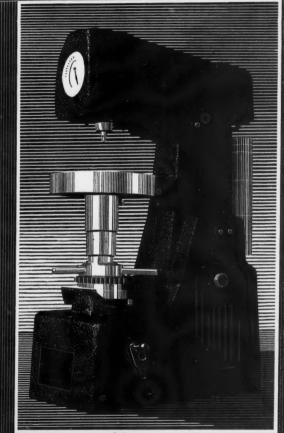
THE ACROMARK CORPORATION

9 MORRELL ST., ELIZABETH, N. J.



ROCKWELL IS OUR TRADE MARK

THEY HAVE EVERYTHING—
PRECISION SPEED ADAPTABILITY



WILSON

CONCORD AVE NEW YORK MECHANICAL INSTRUMENT CO., INC.

, 19

chieve cloo Re rogra rol. ; it re c, ca

as t

e ten contri it n ts pn cycl n inde a smal ng e e ed dist e ca ngi e hes ng e for l g di pare ount ordin driv rotal e R S SU kett hes tical re th is h urne

When temperature has reached the level called for at that period in the process, the Therm-otrol closes the solenoid valve. The main burner goes out, but the pilot burner remains ignited.

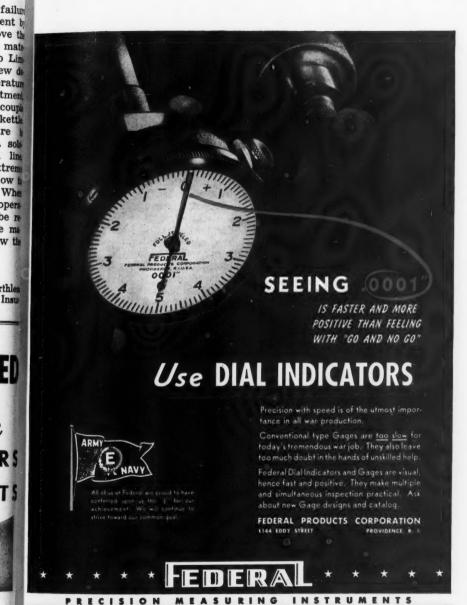
Protection against pilot failure, which would present an explosive condition with ignition failure as the Therm-otrol called for heat, is obtained through a Wheelco Flameotrol. This instrument employs the ability of a flame to conduct a current. An electrode is mounted so that one end is in contact with the pilot flame. The pilot flame completes a circuit, which, should it be interrupted, would cause the Flame-otrol to close a main line solenoid valve. shown in the drawing second from the burner, and another solenoid valve in the pilot burner bypass line. An alarm bell advises the operator when fuel is shut off.

Protection against possibility of a

valve or control instrument failur upsetting a process or treatment h overheating, or by heating above the flash point in the case of some mate rials, is obtained by a Wheelco Lin itrol. This instrument, set a few de grees above the highest temperature called for in the process or treatment is actuated through a thermocoupt suspended in the furnace or kettle excessive temperature If this reached, the Limitrol closes a solnoid valve in the main fuel line shown in the drawing at the extrem right, instantly stopping fuel flow both main and pilot burners. Whe fuel is cut off by the Limitrol, open tion of the equipment cannot be resumed until temperature of the mi terial is reduced to a point below the Limitrol setting.

Your Life Insurance will be worthled if we lose this war. Buy Freedom Insuance—Victory Bonds.





January, 1943

1943

MODERN MACHINE SHOP

197

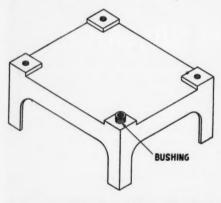


Method of Reducing Amount of Machining Required

By R. RICHARDS Middlesex, England

'N these days any expedient which will make it possible to increase production without detracting from the quality of the product is well worth considering, and the one described here has been used in our plant to advantage.

It frequently happens that two



Drawing Illustrating Method of Assembling Two Sections without Planing Mating Surfaces

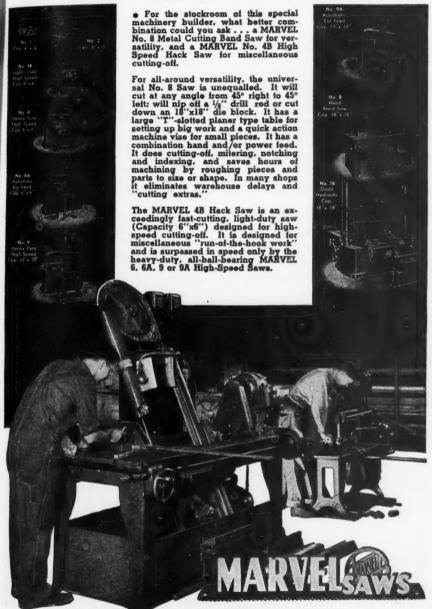
castings are to be bolted together by a bolt at each corner; e.g., a machine body or frame and a base of some sort. The usual method of procedure is to plane the two mating surfaces and to drill both castings for the corner bolts. However, it is possible to eliminate the planing operate without any sacrifice of quality.

Using jigs, both parts are drilled for the bolts, but the hole in one the corners is drilled oversize an tapped to take a bushing, as show in the illustration. The bushing mu be substantial, and the hole through the bushing must be of a size to tak the bolt that is to be used in the corner. The usual method is to make the bushing from a piece of tubing threading it on the outside to make with a corresponding thread tappe into the hole in the casting.

To assemble the castings, the bush ing is first threaded into its hole The two castings are then put to gether and bolted by means of the three bolts inserted through the regular bolt holes. There will be no distortion, since the castings are bolted at three corners only. The bushing is now threaded up against the fourth corner of the casting to provide the necessary support on that corner This may be done by having a slot cut across the lower end of the bush ing into which a flat piece of steel can be inserted to be used in the same manner as a screwdriver, thu making it possible to turn the bushing from the bottom.

With the bushing supporting the fourth corner of the upper casting the bolt is now inserted through the the bushing and the nut applied is

"Versatility" and "Speed" Characterize these two MARVEL SAWS



ARMSTRONG-BLUM MFG. COMPANY
"The Hack Saw People"

5700 Bloomingdale Ave.

or the ossile ratio . drille one of

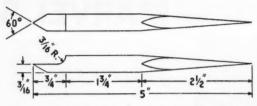
show mu rough tak mak bing mate ppe day hole the regdis olted hine urth the ner. 18htee the hus shthe ng. the

Chicago, U. S. A.

the usual manner. If necessary, shims can be inserted between the castings at any of the first three corners to obtain proper leveling.

The adoption of this expedient eliminates the necessity

of planing the two mating surfaces. The comparatively inexpensive operation of cutting off and threading a piece of tubing is much simpler and quicker, and avoids tying up a large, expensive machine.



Scraper for Removing Hard White Lead from Mandrel Centers

ters we have experienced some diffi. Frap culty in keeping the work running Upon investigation concentrically. we discovered that the heat generated by the friction of the work on the dead centers was sufficient to harden the lead which we use to lubricate innall the centers, thus forcing the work wawin off-center.

ply i

ent

The

chir

reated

on v

le for

NE

C

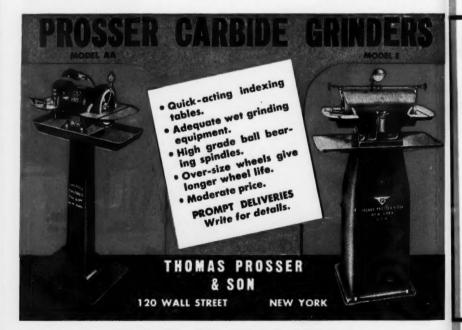
eve

To eliminate this difficulty we made inctio a center scraper, as shown in the ble h drawing, with which the hard white ome lead can be scraped from the center compli hole after one operation has been per- inv formed, thus making it possible to recom

Center Scraper

By C. F. FITZ

N these days of high speed producduction of work mounted on lathe mandrels for machining between cen-



pply fresh white lead for the subseent operation.

The scraper is made from drill rod, ichined as indicated, and heat reated. A file handle of the comon variety makes a very good hanle for this tool.

diffi. Traphic Dimension Translation for Drawings

By JOHN E. HYLER

nters

nning

gation

erated

NE of the difficult tasks that n the arden comes to the draftsman occaricate onally is the enlargement of a work rawing from one scale to another, even the enlargement or the remade action of a portion of one, to enn the hle him to show intricate detail of white ome portion more clearly. To acenter emplish this a great deal of figuring a per- involved, some of which tends to le to recome abstruse, but it is possible to

avoid all of this work and to make an accurate enlargement or reduction without having recourse to figures, if the method shown here is used.

Assuming that you have a drawing that must be enlarged, for example. to a size half again as large as it now is, the first step is to lay down on your drafting board, out at one side but convenient to hand, a rightangle triangle with the 90-degree angle at the top for a peak (any isosceles triangle will do, but the right angled one is convenient to lay down with a drafting machine) of a size sufficiently large that the base line of this triangle will equal or exceed in length practically all of the lines of the required drawing. This triangle is shown in the sketch as ABC.

From the peak point at A drop a line perpendicular to and cutting the base as at the point D. This line AD serves as a dividing line. In the case cited, the existing drawing is two-

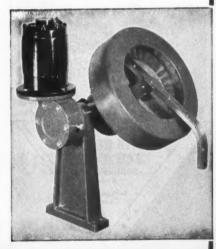
Hoppers EPENDA

For Feeding Bullet Cores, Discs, Nuts, Rivets, Screws, Pins, and Special Parts.

Send Samples for Feeding Speed and Prices

DETROIT POWER SCREWDRIVER CO.

2807 West Fort St. DETROIT MICHIGAN





Dorman Machine Tool Works

NEW YORK, N. Y.

357 CANAL ST.

thirds the required size, so we detend the line AD into three equal pand obtain the points E and F. Doing a line through the point F palel to the base line BC, we now two similar triangles, superimpone upon the other, for AGH is a lar to ABC.

A little thought will show that proposition is embodied according the laws of similar triangles. SAF is to AD as the existing drawing to the required drawing, it follows:

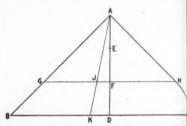


Diagram for Use in Translating Dimension Drawings

that GH is to BC as the exist drawing is to the required draw. It further follows that the same t is true of exactly proportional p of these two lines.

Therefore, in practice we take measure of a line on the exis drawing, either with the divider it be a short line) or with the s at full size, and set it off on the GH, and then project it over to base line BC to obtain our requivalue directly. You will find that can do this very quickly.

An example is given to make matter fully clear. Assume that have measured on the existing dring a value as GJ, you simply stoff from the point G to locate poin Then, holding a straight edge at A and J, the point K is located BC, and BK is the required value the new drawing, corresponding GJ on the old. All values are



Change in Firm Name

w that av-way Tool and Machining Co. ng drav

BECOMES

Sav-way INDUSTRIES

In the past this company has been known as Sav-way Tool and Machining Co., engaged in the manufacture of precision tank and aircraft parts . . . a line of gauges . . . and internal grinders.

Today Sav-way is composed of six major divisions:

End Mill Gauge Internal Grinder

Plastic Precision Production Specialty Engineering

With this change of name and expansion in activities, we announce the opening of our new general offices and main plant at 4875 East Eight Mile.

In addition, two other plants have recently been purchased and a fourth is now in the course of construction. These four plants, together with our physical and chemical laboratory, have been newly equipped with the latest and most efficient machinery to help meet present and postwar needs.

"It will be done" is the significant slogan adopted by the young and aggressive personnel of:

Sav way INDUSTRIES EIGHT MILE DETROIT, MICHIGAN

Representatives throughout U. S. A. and Canada

o we di equal n

d F. D nt F p e now perimp GH is

cles.

, it foll

Dimensi

e exis draw

ame t

onal p

take

e exis

ividers

the s

n the

rer to

requi that

make that ng dr ply se e poin

ge ac cated

value nding

are

down on GH in this manner, and A is used in the same way in every instance.

In those few places and cases where there is a great amount of this kind of work to be done, one may, if he chooses, make a good-sized drawing of a triangle ABC on a piece of tracing paper, including the dividing line AD, and run off a number of prints from the tracing. Then he can simply help himself to a new print when he has a

new problem on hand, or when the one he is using becomes unusi because of wear.

Simple Center Finder

By A. H. WAYCHOFF

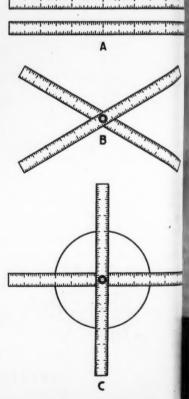
PRESENTED here is a drawing a center finder of simple design and and more accurate the bell punch or the usual center for the eyelet that in them together, the tool consists tirely of two cheap steel scales of kind that is usually available in a



No.	Range	Wt.	Price
MO	3/8" to 1/2" 1/2" to 18"	78	\$ 4.50
MI	1/2" to 18"	3/8	5.75
M2	18" to 1"	1	7.75
M3	l" to l'a"	23/4	12.00
M4	1 18" to 21/2"	9"	22.00
M ₅ B	21/2" to 31/4"	171/4	44.50
M5C	31/4" to 4"	301/4	44.00
M55	31/4" to 43/4"	421/4	89.00
M6B	4" to 43/4"	38	70.00
M6C	43/4" to 51/2"	53	76.00
M5	21/2" to 4"	421/2	68.50
M6	4" to 51/2"	78	100.00

Good delivery of some sizes from stock.
Write or wire for bulletin M42-1M.

K. O. Lee Company
Aberdeen, South Dakota



Simple Pocket Center Finder

to work...

.and you'll see Real metal cutting action!

HEN you want fast precision metal cutting in production, tool room or general maintenance work — put a Wells on the job. You'll have a saw that handles many shapes and types of metal with unusual smoothness and accuracy.

The Wells Series 80, above, is the latest model of the popular Wells No. 8. It has all the advantages that Wells have built into their products through years of leadership in band saw manufacture. It is a rugged, versatile unit, capable of cutting up to 8" rounds or 8" \times 16" rectangles. You will find it one of the handiest tools in a plant. You can get one quickly too! Phone your distributor or write us.

wells Has Established Leadership



WELLS MANUFACTURING CORPORATION

METAL CUTTING

BANDSAWS

vhene unus

der

designate the central central

At Last a Modern . . . BAND SAW GUIDE



HARDER MATERIALS 50% LESS FRICTION

DEALERS-Write for Proposition.

COVEL HANCHETT CO.

BIG RAPIDS • MICHIGAN
113 First Ave., S. W., Portland, Ore.

dime store. They are six inches and three-eighths inch wide.

To make the center finder, of fully lay out and drill a 35-inch at the exact center of each at then fasten the two together with common eyelet as shown at B. eyelet should be set, however, so it will work a little hard. That a pletes the finder.

Mand T

eating

estima

use,

mer

To use the device, spread then so that they will be at right an as shown at C, which is easily with the aid of the scale gradual on either side. Then, to find the ter of a piece of work, lay the non the surface of the work and just until all scale readings are same at the edge of the work. done, make a scriber point or punch mark through the hole in eye. This locates the center of workpiece.

IMPROVED BALANCING WAYS



Four chilled iron discs rotate on special sensitive bearings. For balancing, straightening and trueing. Write for details.

Swing	20"	40"	60"	72"	96"
Greatest Dis- tance Between Standards	20"	30"	30"	66"	88"
Capacity in Ibs.	1,000	2,000	2,000	5,000	10,000

ANDERSON BROS. MFG. CO.

1926 Kishwaukee St.

210

Rockford, III.

Milling With a Grinding Attachment

SOME time ago the foreman is machine shop in Racine, Wis sin, was faced with the task of sing spiral grooves in each of 50 minum end caps, the grooves to symmetrical and of an even do and width. The job was done by following method:

An adapter was made to hold cap on the faceplate of a division head, and the head was mounted the table of a Milwaukee horizon milling machine. An angle plate then bolted to the arbor support, a Dumore No. 5 Grinder was mount in position on the angle plate, shown in the illustration. Using "D" quill, a 1/8-inch high speed so "fishtail" milling cutter was chur in the grinder spindle in the composition to engage the workpiece geared to the table feed.

TY

RICA'

to the l

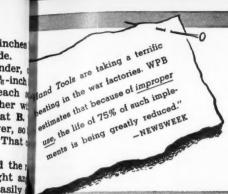
s being

oil is u

TORY

RUY

WAR



le.

the f

s are ork.

or

ole in er of

dind

nan

Wis

of f 50

es t

n d e by hold

divid

inted

orizon late

Usin

COM TORY ece BUY

ary,

FACED WITH THIS roblem?



THIS FREE BOOKLET WILL HELP YOU

THE Cleco Cartoon Book presents, in f I a series of amusing cartoons, many useful hints for the proper care of pneumatic tools. It's full of practical do's and don't's telling how to get more work out of your tools, with minimum expense for repairs and compressed air. Your men will like the down-to-earth shop-talk used in this booklet. We have already had requests for thousands of copies. In the interest of efficient war production, write now for your free copy.

TYPICAL CLECO CARTOON

ort, PRICATION-Proper lubrication is most important. Each ng, and at noontime, the operator should inject a few drops moun co "Never-Gum" oil, or other high-grade light machine late, to the hose connection, unless an efficient air line lubri-being used. Under conditions of continuous operation, of should have a few drops of oil every hour. Caution: If too ed sta oil is used, or too heavy a grade, the tool will be sluggish. chud

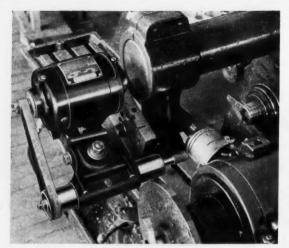


THE CLEVELAND PNEUMATIC TOOL

3781 East 77th St.

Branch Offices in All Principal Cities

Cleveland, Ohio



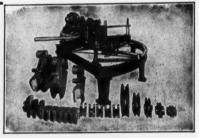
Using Dumore Grinder to Spiral Grooves in Aluminus Caps

ter had penetrated to correct depth, then feed was engaged. It the workpiece was fed ward at the correct of speed to develop spiral while the workpiece was revolving. The se was easily made, and job was done both conly and economically.

With the cutter running at the correct speed for machining aluminum—which was made possible by the high speed of the grinder—the table was fed forward until the cut-

Brazed Strippers Aid D

THE life of metal stamping di increased and the quality of sta ings is improved by a simple



FOR NATIONAL DEFENSE We Are Ready To Serve You

THE AMERICAN COLD PIPE, CONDUIT AND TUBE BENDING MACHINES

OUICK DELIVERIES . .

HAND OPERATED TYPES in capacities of 1 in., 2 in., 3 in., 4 in. MOTOR OPERATED in three capacities, ½ in. to 4 in., ½ in. to 6 in., and ½ in. to 8 in.

Early shipments on hand operated machines; on motor powered from four to six weeks.

Wire or air mail letter for printed matter and prices.

Three New Machines: No. 1—For bending extra heavy pipe up to 3 in. No. 2—For bending all kinds of thin gauge tubing without use of mandrel. No. 3—For bending IPS conduit.



AMERICAN PIPE BENDING MACHINE CO., INC.

25 PEARL ST.

BOSTON, MASS., U. S. A

A Mine

ted to

then

red.

as fed

velop

work

The s

, and

lly.

d Ding die of statistimpli

OF PURE HIGH SPEED STEEL! • MANY would consider the war almost won if a mine were discovered which, by some freak of nature, bore only high speed steel. The tungsten, molybdenum, vanadium, and other elements alloy steels contain are needed badly and needed now . . . In effect, such a mine exists—in the metal-working shops of the Nation. Get your old tools, dies, and fixtures to the scrap dealer or back to the mill just as soon as you have no further use for them!

NATIONAL



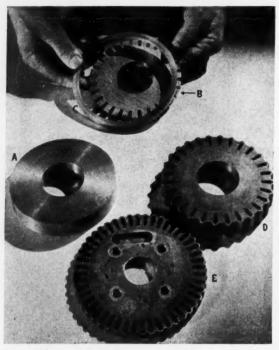
REAMERS, HOBS
MILING CUTTERS
COUNTERSORES

TWIST DRILL AND TOOL COMPANY

HOME OFFICE AND FACTORY-DETROIT, MICH.

Top and Die Division - Winter Brothers Co. Wrentham, Mass.

Parity Services & How York & Chicago & Garaland & San Francisco & Discolution to Principal Cities



Die life is increased and quality of metal stamping proved by machine-milling stead of the usual hand won of stripper slots, at the Westhouse Electric and Manufering Company. Disk "A" is ted into spider "B," and the er ring "C" is shrunk to it copper-brazed in a contractional contraction of the copper shrunge of 20% atmosphere furnace at 2000 grees Fahrenheit. The br assembly is then machined and ready for use. A one hand-filed stripper "E" man the old method is shown in foreground.

1. 2.

erhap

960 E.

method of making die strippers at the Westinghouse Electric and Manufacturing Company. Other advantages include stripper accuracy equal to that of the die and a manufacturing cost of 1/3 to 1/15 that of the old conventional method.

A stripper has an important bearing on the overall performance of the

die. For example, in m ing motor lamination the clearance between punch and the die is we ur and ally in the order of a thousandths of an intertainle and the stripper must a solve almost as accurately a it and the stripper was made on the stripper was made on All one piece by laying out our planting and the bout it. boring, sawing and har bout it filing the slots. Sue Perhe

operations have the hazard of carroper ing non-uniform clearance in slow ou are a factor that hastens the wear terhap the die.

By the new method, a disc of too little proper grade of tool steel is machinal to the outside diameter of the stood edge, and equidistant slots are on a milling machine using a ground I

GEM DRILL PRESS AND MACHINE VISES



Modern Vises for Tool-room and Produ tion. Sizes ranging from 3" to 10% opening. Strong, Versatile, Quick-Actin Pay for themselves in time-saving.

Write for circular describing entire li of GEM MACHINE VISES.

J. E. MARTIN TOOL & DIE WORK Springfield, Ohi 548 State St.

MODERN MACHINE SHOP

lanuary, January,

OU ANSWER "YES" TO ANY ONE OF THE FIRST 6 QUESTIONS

the and We'll Answer Zuestion No. 7 Ourselves

Is your honing problem:

- 1. GENERATING TOO MUCH HEAT AND DISTORTING THE WORK?
- 2. TOO SLOW AND RETARDING VITAL PRODUCTION?
- 3: CAUSING TOO MANY COSTLY REJECTS?
- 4. PRODUCING POOR FINISHES?
- 5. BREAKING AND CHIPPING ON EDGES?
- 6. WEARING OUT HONES TOO RAPIDLY?
- 7. CAPABLE OF BEING SATISFACTORILY SOLVED?

is wour answer to No. 7 is "Yes" too - a big, emphatic, confident "Yes."

on in ertainly your honing problem can must a solved! There MUST be an answer tely it and our engineers—located in all orms arge cities—will be glad to find it for made ou. All you do is call us in, explain out, our problem and cease worrying it has bout it. We will do the rest.

Sur Perhaps your stone is not of the far roper grain or grade for the metal slow ou are honing or the finish you desire? The remaining of the finish you desire? The remaining or the finish your great or of too little? Perhaps your coolant is not achieved to the job? Perhaps your rotates on and and traverse speeds are not

properly synchronized?

Whatever your particular "perhaps" may be, one thing is certain: The MID-WEST ABRASIVE COMPANY can solve it for you. MID-WEST engineers are specialists in the problems of grinding, honing and superfinishing. They have helped many production men turn out better, more dependable products, faster and more economically. Our field engineers are maintained for YOUR CONVENIENCE and OUR MUTUAL BENEFIT. You are cordially invited to call on us for this assistance—anytime.

FTOMID-WEST ABRASIVE COMPANY

Manufacturers of DEPENDABLE Abrasives

1960 E. MILWAUREE AVENUE

DETROIT, MICHIGAN

roduc VICTORY 10% BUY cting

mpings milling nd work ne West

A is a nd the control

One-pi

own in

in m

natio

reen i

of a

re



*	Honing	Stones

- * Superfinishing Stones
- * Grinding Wheels
- ★ Emery Cloth
- * Sandpaper

Mid-West Abrasive Company,
1960 E. Milwaukee Avenue,
Detroit, Michigan
Gentlemen: Please send me additional
information on Mid-West Micro Bond honing
and superfinishing stones.

Name
Company
Address

form cutter. An outer ring is shrunk to the milled piece and copper brazed in controlled atmosphere furnace.

University Offers Aid To Writers In **Technical Fields**

The needs of the technical worker or of the professional man who knows his subject but may lack certain skills in writing about it to meet precise editorial standards are kept in view in a university correspondence course, "Specialized Exposition," offered by the Extension Division of the University of Wisconsin, Madison.

As outlined for interested students in any state, especially those in technical fields, this course encourages original composition on topics related to a stu-dent's daily work, with the aim of pro-viding effective training in preparing articles for publication, business letters and reports. Emphasis is placed on proper organization and arrangement of materials, an effective professional style, the important points in paragraphing, punctuation, capitalization, abbreviation, proofreading, and other requi commonly weighed in the editor scales.

Because the assignments relate to ics in the student's own field of h est, the training is designed to meet specific technical needs.

Score Highest in Industry

If any American boys are subject chills from the draft and hope to jobs in industry, read on. The Nation Safety Council reports that casualties men in service since Pearl Harbor, cluding the African campaign, told 5,694 dead and 3,435 wounded, w in American industry during the speriod 44,500 were killed and 3,800 wounded.

M. S. A. Comfo Dust Respirator v Plastic Filter Containers is the sub of Bulletin No. CR-9 released by Safety Appliances Co., Braddock, Thas and Meade Sts.. Pittsburgh, Pa. 0 free upon request.

DESMOND GRINDING WHEEL DRESSERS and CUTTERS



We can supply you with the proper Dresser and Cutter for all of your grinding wheels.

Ask for copy of our catalog and name of your nearest dealer.

SIMPLEX

Steel Slide / I S E S



A full line of Machinists', Filers, Welders, Production and Drill Press and Milling Machine Vises. Let us send you our vise catalog and

name of your nearest dealer.

THE DESMOND-STEPHAN MFG. CO. Urbana. Ohio

MODERN MACHINE SHOP

Janua January,

*Fo requ

rely plate

stee

care

Wid insp mas

grai

trea

ТΗ

late to do fine to meet sustry subject per to le Nation sudities carbon.

PRECISION WILL WIN/

USE CHALLENGE



★For accurate lapping of joints required to hold oil, you can rely on these precision-built plates. Made of finest semisteel, specially heat-treated and carefully machined, with ½6"

grooves ½" apart, running full length and width of surface. Wide range of sizes. Available with or without all-steel, arcwelded stand equipped with lock leveling screws. Write!



Widely used for tool making, inspection, and testing; also as master plates. Made of closegrained semi-steel, specially treated to overcome strains and

CHALLENGE

SEMI-STEEL

SURFACE PLATES

distortion. Three-point suspension. Heavy deep ribs on underside form triangular supports. Hand-scraped or precision ground. Furnished with cover.

THE CHALLENGE MACHINERY COMPANY

GRAND HAVEN, MICHIGAN

430

January, 1943

n, totaled, withe so

e sub

nd



Morrison Flame-Type Mouth and Taper Annealing Machine for Steel Cartridge Cases

To meet the demand for a machine which would quickly and economically produce a uniform anneal at and near the mouth of steel cartridge cases to facilitate tapering and crimping operations, the Morrision Engineering Corp., Cleveland, Oho, has brought out the flame-type mouth and taper annealing machine illustrated herewith. The machine is available in two general types, one for accommodating .50 cal. and 20

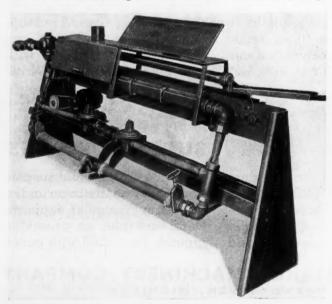
mm. cartridge cases and another handling 37, 40, 57, 75, and 105 3-inch and larger cartridge cases.

The machine for small size cases straight line type while the larger chine is a modified dial type. Both chines are gas fired and include a tinuous type conveyor. In the larger chine, the conveyor chain is equipwith rotating work spindles which provided with fixtures suited to the of the cartridge cases being anneal

During operation of the Morn Flame-Type Mouth and Taper Annel Machine, cartridge cases rotate as

> pass along in of flame. But are of the blast type with ad ments to pro compensation various gases operating con tions. Burner eq ment may also provided height adjustment when cases of ferent sizes on be annealed in machine.

Loading and loading of carts



Morrison Flame Mouth and Taps nealing Machine Steel Cartridge Need a fine pitch or a super-smooth cut on "extra-special" war work?



uary, lanuary, 1943

nother 105 a cases. cases

Both and a larger

which

o the connect Morris

Anned

e as

ng in i

blast

h adi

pro

rtion

ICISES |

ner ed

y also

es and cartri

lame

Taper chine dge 0

d w ljustm

Bun

cases is a continuous manual operation at one end of the machine, which is provided with sheet metal hood with vent connection for enclosing operating mechanism. Hinged sides on the hood permit easy burner adjustment.

Designed to occupy a minimum of floor space, the Morrison Flame-Type Mouth and Taper Annealing Machine is supplied complete with combustion blower, all necessary motors and starters. Where a close control of temperature in the lower part of the cartridge case is necessary to prevent annealing beyond a definite point, a cold blast blower may be incorporated into the machine at an additional cost. According to the manufacturer, the machine can also be easily adapted for use in drawing temper on file tangs, heating end of round rods for heading or flattening operations, drawing temper on small drill shanks, annealing ends of cut lengths of copper and brass tubing, and

DeVilbiss Automatic Shell Coating Equipment

The DeVilbiss Co., Toledo, Ohio, announces a line of high speed automatic equipment for automatically coating bombs, shells, shot, grenades, and cartidge cases of all kinds in sizes ranging from 20 to 155 mm. The line includes units for spraying exteriors only or for

painting both interiors and exterior pending upon the requirements of job. All units are said to handle equal facility the finishing and commanterials commonly specified for munition.

Every unit though basically similar specifically designed to do a partial job. Spraying stations are located one or both ends of the conveyor, pending upon the specified product rate. On one type, three stationary tomatic spray guns are actuated we each shell moves within spraying and Another outfit employs two gunsafor outside and one for inside spray both of which are automatically me horizontally and vertically with the integral of the stationary of the s

A third unit for shells having a side adapter has a spray gun with the type extension which, together with other moving extension gun, coan interior surfaces while a third morgun paints the outside. Conveyor less determined by the drying and adding requirement of each job, and eit dry or water wash exhaust can be nished, as desired.

Gulf Plastic Petroleum B for Anti-Aircraft Guns

An unusual plastic petroleum des ed especially for use in lubricating magazines of marine anti-aircraft q has been developed by the Gulf

DeVilbiss Automatic Shell Coating Unit for spraying interior and exterior surfaces of shells varying in size from 75 to 155 mm.

tory.
o the
vays
ion at

ase. vith netho quipi crew djust

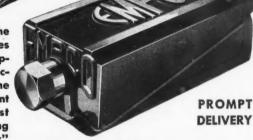
The most Efficient erion **LEVEL**

for your equipment



he illustrations tell much of the tory. Designed to align themselves o the most uneven of floors, slipvays are ground to minimize fricson at point of contact with machine base. Positive two-way adjustment with increased limits. Simplest method of setting, and keeping equipment LEVEL. Turn the "hex" screw head and presto!—a level edjustment as precise as wanted.

Write for full particulars to:



AVAILABLE IN 3 SIZES:

No. 1-2" x 29/16 x 41/2" No. 2-23/8" x 3" x 61/8

No. 3-31/8" x 4"

THE ENTERPRISE MACHINE PARTS CORP 2733 JEROME AVE.

its of ndle d coo for

simila partie ocated

eyor, produc nary ted w ng m runsspin ly mo the s ig a rith h with coals mov or le and l rnd ei n be

B for

den rting caft g

Gulf

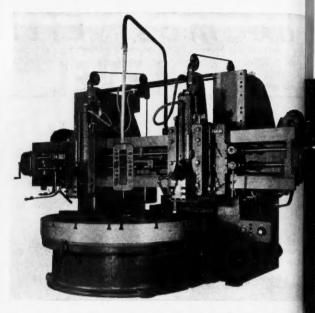
Corp., Gulf Bldg., Pittsburgh, Pa. The petroleum, which is known as Gulf Plastic Petroleum B, is said to lubricate the springs of magazines in such a manner that they will function smoothly in cold or hot climates. In addition, the petroleum is said to protect the springs from rust and corrosion resulting from contact with salt water.

Gulf Plastic Petroleum B, accord-

ing to the manufacturer, is also applicable to other war equipment, machines, and so on.



Designed for use in the manufacture of turrets and turret rings employed in constructing tanks, the Federal Vertical Boring Machine shown herewith is now being produced by The Federal Machine & Welder Co., Mineral Ridge, Ohio. The machine covers a floor space of 196 square feet, is approximately 15 feet



high, and weighs 110,000 lbs. The dei of the unit includes approximately parts, the largest weighing 23,000 The machine is available in two dient models, one with a capacity of inches and another with a capacity 112 inches.

Acromark "Hercules" No. 1 Hot Stamping Press

Designated as the "Hercules" No a hot stamping press especially des

... for more than 1001 odd jobs



The Hjorth Bench Lathe has the speed, accuracy, handling east, and dependability that appead to every operator. That's why you'll find the better shops equipping with the Hjorth Lathe.

WRITE TODAY FOR DATA AND PRICES.

HJORTH LATHE & TOOL CO., 12 BEACON ST., WOBURN, MASS.



WELDON ROBERTS Brightboy

"The Soft Rubber Binder Cushions The Abrasive"

Check Your Time Savings . Compare the Results OF THE 3-WAY ABRASIVE PERFORMANCE DE-BURRING

BRIGHTBOY'S unique abrasive action reduces working time and bridges the gap between the grind and the buff-frequently doing, in one operation, work which formerly required multiple set-ups! THIS MEANS INCREASED PRODUCTION!

Available in wheels, and in blocks, rods and special shapes with innumerable applications for machine, manual and drill press work. Information and prices from your dealer or

BRIGHTBOY INDUSTRIAL DIVISION WELDON ROBERTS RUBBER CO., Newark, N. J., U.S.A.



e desi

rtely 1 3,000

o diff y of ! oacity

0. 3

" No.

S acs the g ease, ppeak s why shop Lathe. ATA

A \$8.

ed for marking crystal holders used in military communication systems has been brought out by The Acromark Corp., 9 Morrell St., Elizabeth, N. J. The press is controlled by means of a large handwheel and can be plugged into any regular electric light socket or extension for immediate operation.

The ram of the press is provided with an automatic stamping head having an electronic cartridge heating unit and thermometer for control. A white or other color transfer tape is automatically fed

Acromark "Hercules" No 3 Hot Stamping Pa

under the marking type or dies at ea arin stroke of the ram, thus producing mark in contrasting color on the crys holder. By simply releasing a set same Ax on the ram, the hot stamping head as YNC. be quickly interchanged with a tw line Hercules holder with type for stomethine ing metal name plates—integral par var for crystal holders. Likewise, the previate is said to be suitable for cold stampinital of name plates and numerous of parts. To change from hot or cold stam ing, the tape feed lever is simply a easily disconnected.

MILLING - DRILLING - BORING ATTACHMENT

> for **Heavy Duty Operations**

Uses many types of cutters on a wide range of work. 1/16" to "4" end mills.

FEATURES

Large size spindle with No. 9 B&S Taper. Large quill diameter with a travel of 4". Furnished with 1/2 h.p. motor.

The aluminum pulleys

provide a range of six speeds, from 250 to 3000 R.P.M. The spindle takes 1/16" to 3" end mills. Quill is counterbalanced and hardened and ground. Overarm brackets equipped with spreader screw for easy mounting.

IMMEDIATE DELIVERY Send for Descriptive Folder.

RUSNOK TOOL WORKS

4840 W. North Ave.

Chicago, III.



QUICK SET-UPS ON ANY PUNCH PRESS

DICKERMAN Hitch Feeds are adaptable to any ordinary punch press without press alterations. Feeds from any posi-tion on any style die...from zero to its limit (2" on 2" Hitch Feed and 4" on 4" Hitch Feed) for each stroke of the press.

> Quick set-up...economical for short runs. Write for Folder No. 84.

H. E. DICKERMAN MFG. CO. 321 Albany St. Springfield, Mar

YNC

to h

265

Established Nineteen Hundred and Thirty-Two

STRICERO BLASTS THE PANZERS!



SYNCRO is making parts for subat emarines, bombers, tanks, guns, etc.

Icing to help blast the panzers—bombert scretche Axis and torpedo enemy ships.

In the control of the control of

workers are proud to be Soldiers of Production on the Machine Front. SYNCRO welcomes the opportunity to handle your special engineering and production problems now—and after the duration.

SYNCRO DEVICES inc.

265 Bermuda Avenue Ferndale, Michigan

Complete manufacturing facilities for development of precision machine tool parts — special tools — fixtures — production parts — plug gauges.



MANUFACTURERS OF PRECISION MACHINE TOOL PRODUCTS

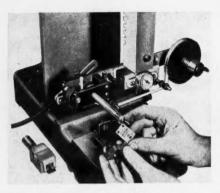
ing Pn

stam

ly a

posilitch each

uns.



Close View of Acromark No. 3 Hot Stamping Press, Showing Depth Control Device.

An outstanding feature of the Acromark Hercules No. 3 Hot Stamping Press is a depth control plate on the front of the ram which enables the operator to set the press for consistently uniform marking. The ram is a square, serrated type with adjusting screws to compensate for wear, thus ensuring accurate

marking at all times. For stamping to ous sizes of parts and irregular shap special fixtures can be furnished.

G-E Motor Fitness Manual GED. A 40-page illustrated manual on subject of motor fitness requirem has been issued by the General Electron, Schenectady, N. Y. Although marily intended for plants converted war production, the manual is said prove valuable in all plants in we motors are widely used.

The manual discusses how to get most service out of old and new most have procedure of "switching" mot from one job to another and of equing old machines with new most also included is data on the selection of motors, various the following of motor enclosures, secondary ratio of standard integral horsepower most ways to determine WR2, motor main nance, full load currents of motors, selection of a.c. control, and the use the hook-on volt-ammeter. A supment explains how to save critical tor materials and includes information the use of load-time temperaticharts. Copy of Manual GED-1017 tupon request.



Industry's Newest Tool . . . MEAD BANDSANDER

It is a time, labor and money saver on innumerable jobs in any shop. Sharpens tools, cutters, etc., of many "kinds." P.O.B. Chicago, \$14.95.

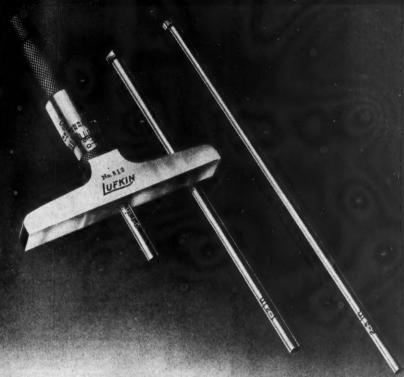
MEAD SPECIALTIES CO.
15 S. Market St. Dept. 13-A Chicago, III.



THE WARDWELL MFG. CO.

nuary,

UFKIN MICROMETER DEPTH GAGE



CHECKS DEPTH OF HOLES AND SLOTS QUICKLY, ACCURATELY

Here's the tool designed expressly for obtaining the depth of holes and slots with micrometer accuracy. Gage is provided with three rods (5/32" diameter) which permit measurements from zero to three inches by thousandths. Patent lock nut locks rod at any desired point. Write for catalog.

BUY THROUGH YOUR DISTRIBUTOR

UFKIN

SAGINAW, MICHIGAN - NEW YORK CITY TAPES - RULES - PRECISION TOOLS

enuary, 1943

ary,

oing w

on in iremed Electron

orma pera 1017

ins

MODERN MACHINE SHOP

23

NEW SHOP EQUIPMENT

Covel No. 22 Universal Cutter and Tool Grinder

Illustrated herewith is the Covel No. 22 Universal Cutter and Tool Grinder which has been brought out by the Covel Mfg. Co., Benton Harbor, Mich. The machine, which is designed to swing work up to 10% inches in diameter, is provided with a heavy rugged box-type bed having three-point floor bearing. All controls of the machine are located in such a manner as to permit them to be conveniently operated from the front or rear of the machine.

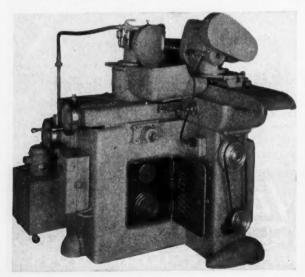
The table and saddle of the grinder are mounted on anti-friction ball bearings which operate in hardened ways on the bed. Table and saddle adjustments are firmly maintained by means of locks. The table can be provided with power feed on special order, in

which case an electric reversing is used that furnishes the table three feeds through a V-belt. rapid cross travel to saddle is also av able on special order. Likewise, a sw type adjustable micrometer limit forward travel of saddle for of inspection and accurate infeeding be obtained.

The grinding wheel spindle of machine is of a spring-loaded large ball bearing cartridge type and is vided with lock for holding in posit when changing grinding wheels. spindle, which has three speeds, is deen through a V-belt by means of a tor enclosed in the base of the mad where it is protected from dust, and on. The V-belt is adjustable for tens and can be quickly and easily chang Specifications of the Covel No. 22 U

versal Cutter and Tool Grinder are follows: longitudinal travel of table inches; vertical movement of grind

wheel spindle, 71/2 inche cross movement of a face dimensions, 5% 1 vo cos inches; height from ble to floor, 41 inch vertical distance from the center of spindle to to atrust table, maximum, i The table, maximum, i The inches, maximum si amet grinding wheel employ he m 8-inch diameter x ½ he inches, particularly and the spindle motor, ½ he uxilia 1,750 or 1,425 r.p.m.; headstock motor, 1/6h b. per 1,150 to 1,425 r.p.m.; he signed space, 57 x 89 inches large assortment of tachments, including wet grinding attachments. The are available.



Covel No. 22 Universuare Cutter and Tool Graphess i

MODERN MACHINE SHOP

January, Innuary,

aldw

for

The !

usion aldwi

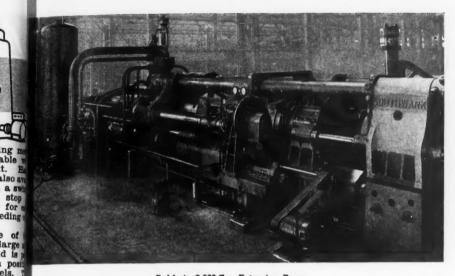
aldwi nia, F

direc

vo cors

The

ress p. m on w tor s



Baldwin 3,500-Ton Extrusion Press

aldwin 3,500-Ton Extrusion Press for Direct and Indirect Work

The illustration shows a 3,500-ton exusion press manufactured by The aldwin Southwark Division of The aldwin Locomotive Works, Philadel-The r are table table aldwin Southwark Division of The grind aldwin Locomotive Works, Philadeljinch hia, Pa. Designed for both direct and of al direct extrusion, the press is equipped ables ith a 250-ton hydraulic billet shear, 5½ 1 vo coarse tooth saws driven by 40 h.p. from otors, and a billet handling device to inche ke the heated billet from the furefrace and deposit it in front of the to to trusion container.

Im. i The press is of the four-rod type, um, with forged tension rods 16 inches in signameter weighing over 25,000 lb. each.

m standard tension rotes to increase in standard many standard meter weighing over 25,000 lb. each. mploy he main cylinder casting of the mactive meters 1,000,000 lb. and complete with le; m veighs 1,000,000 lb. and con a heuxiliaries, 1,500,000 pounds.

A h uxiliaries, 1,500,000 pounds.

r.p.: The 59-inch diameter ram, under 3,200
1/6hib. per square inch working pressure, is
m.; h designed to handle billets up to 24 inches
ches in diameter and up to 36 inches long.

of The ram has a working stroke of 7 feet
diding and is rapid traversed to working posichme the long of the point of the control of The Baldwin 3,500 - Ton Extrusion ress is operated by means of two 500 p. multiple plunger pumps in connection with a hydro-pneumatic accumulator system designed for 3,500 lb. per luare inch hydraulic pressure. The Gracess is also available in smaller sizes

with capacities from 750 to 2,000 tons.

Hampton Model "G" A.C. Arc Welding Machine

Designed for general welding in manufacturing plants, machine shops, steel construction work, and so on, the Hampton Model "G" A.C. Arc Welding Machine illustrated herewith is now being offered by the Hampton Electric Mfg. Co., 304 Archie St., Oakmont, Pittsburgh, Pa. The mashine is ar-ranged for operation on a supply voltage of either 220 or 440 volts and has a welding capacity of from 30 to 300 am-According to the manufacturer, the unit can be operated continuously at 225 amperes. The welding current is controlled by means of a crank located on top of the machine which, when turned, provides an infinite number of welding heats within the range of the welder.

The Hampton Model "G" Welding Machine is equipped with a thermostatically controlled, mercury arcless, automatic cut-out switch which protects it against overloads for a long interval of time. Transformer windings are made of square wire of sufficient size to permit considerable overloads. The operating panel of the machine is made of

Unive

, is d of a mach

t, and r tens

chang . 22 U



TWO TIPS FOR TRAINING NEW WORKERS

2 Give them STAR Unbreakable Special Flexible, the all-over green blade that cuts like an "All Hard" yet is so flexible they cannot break it in use in a frame.

2 Give them "Metal Cutting", 20-page STAR booklet of back saw knowledge. Easy-to-take instruction on selection, use and conservation of blades and frames. It's free.



*T.M. Reg.-Blades bearing the name "Moly" are mad by Clemson Bros., Inc. and affiliated comp

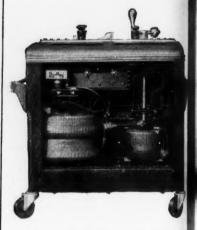


bakelite and is mounted on top of unit where it is plainly visible and

ily accessible to the operator.

The design of the machine also cludes a stabilizer in the welding ch which controls and balances the age and current across the arc, decreasing spatter and assuring a h geneous weld.

The Hampton Model "G" Arc Well Machine can be used with any electrode from 18 to 1/4 inch inch for either horizontal, vertical, or a head welding. The machine is 18 231/2 x 28 inches high and weight



Hampton Model "G" A.C. Arc Welding Machine

lb., and is supplied complete ground cable, electrode cable, and e trode holder. The unit has a bl crinkle finish and stainless steel tr mings and is provided with two is sturdy handles and four large ball be ing casters, thus making it easily po able.

Morey No. 2G Turret Lathe w Combination Screw and Level Cross Slide

Morey Machinery Co., Inc., 410 Brod St., New York, N. Y., announces to its No. 2G turret lathe is now available HELDC with an improved quick-acting con nation screw and lever cross slide. design of the slide is such that ell type of feed or the screw feed in com

held

SHELDON

heldon BBU-1242 WQ Precision Lathe

This quality 12 in. ball bearing tool room lathe is built for precision work and will retain its accuracy under long and hard usage. It has extra collet capacity (to 1" round), the finest precision ball or roller bearings obtainable, an improved heavy-duty, double wall apron with power cross feed; full quick change gears and full bowl head-stock. Its improved Sheldon 4-speed, V-belt, lever-clutch operated, underneath motor drive is entirely enclosed in the pedestal leg and has anti-friction bearings. It is so designed that spindle belts operate through a standard 1-piece bed. This bed is bridge-braced with heavy cross girts and has hand scraped ways—2 V-ways and 2 flat ways.

If interested in 10", 11" and 12" quality lathes be sure to see the SHELDON.

HELDON MACHINE CO., INC., 4250 N. Knox Ave., Chicago, U. S. A.

op of

e also
ing cin
the v
arc, t
g a ho
c Weld
any v
inclus
or or
is 16%
eighs

elding

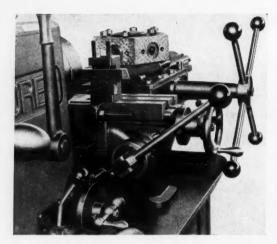
nd el a bla el tri o las ill be ly po

ever

Broom es ti vaila

COM

COM



Close-Up View of Combinations and Lever Cross Slide of Man No. 2G Turret Lathe

Lindberg Super Cycle Forced Convection Ha Treating Furnace

Designed to speed up hard in g, annealing, normaling tempering, nitriding, and of heating operations, a for convection heat treating in nace with heating capacity to 1,750 deg. F., designated the Super Cyclone, has been veloped by the Lindberg E

neering Co., 2444 W. Hubb St., Chicago, Ill. The forced conver heating principle employed by the nace permits the unit to be installe a pit so that work can be convenien introduced into the furnace on fixtu or in baskets. Furnaces of this are normally installed with top of

nation with the lever feed can be readily employed, depending upon the work being done. A single quick-acting clutch provides a means for the selection of the type of feed desired, no tightening or loosening of set screws being required for changing feeds.

KARELSENS DIAMONDS SET IN SPECIAL ALLOY

FOR ECONOMICAL WHEEL TRUEING

We Make Special Tools for Shaping Thread Grinding Wheels.

PHONOPOINTS — SHAPED TOOLS — GRINDING WHEEL DRESSERS DIAMOND POWDER IN ELEVEN SIZES

Diamonds carefully selected for most accurate and economical service. 91 Years Experience.



SALESMEN WANTED

Big demand for our products. State qualifications fully. All information in confidence. Write — Some territories still available.



KARELSEN, INC. 54 W. 45TH ST., NEW YORK, N. Y. Tel. VAN 6-5688

ributes To the United States (Army) Ordnance Engineers Joy designing The Yanks hich were the Spearhead of the Smashing orth Chrican Campaign verolor (1) Pil Burner Corporation CBallimore Mct.



Lindberg Super Cyclone Forced Convection Heat Treating Furnace

nace extending approximately 24 inches above floor level.

Heating is by gas, oil, or electricity.

The heat is forced under pressure high velocity fan through every puthe charge, thus eliminating radiato the work from a source hotter the desired work temperature, as as one-sided heat which may at as one-sided heat which may addistort, or pull work out of shape. circulating fan is located in a sep chamber away from the work chawhere it is safe from damage whight result from carelessness in forming loading or unloading tions. The fan, fan shaft, and air are made of nickel-chromium he sisting alloy.

HYDR

DE

Prov toug

John

for a

Rivi

ders

for a

RIVIT

M effic

The fuel fired Super Cyclone co essentially of work chamber, fan ber, and combustion chamber. electric Super Cyclone is of a construction except that it inclu heating element chamber in place combustion chamber. The Super Cy Furnace is made in 30 standard m ranging in work chamber size fro inches diameter x 20 inches deep inches diameter x 84 inches deep. cal applications of the furnace in normalizing gun forgings, ann gray iron castings, hardening gears, normalizing and hardening castings, and so on.



Atlantic Metal Cutting Band Blades have been develop through twenty years of resea and specialization.

> Send for Free Booklet

ATLANTIC SAW MFG. CO.

Metal Cutting Band Saws Exclusively

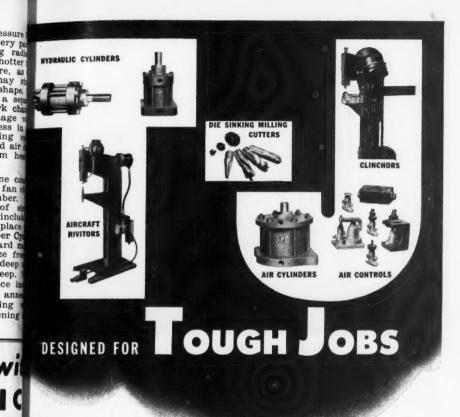
155 Brewery St., New Haven, Conn.





BAND SAWS

January,



Proved "on the firing line" in industry's tough jobs for a quarter century... Tomkins-Johnson products are widely known today for ahead-of-the-times performance!

nd

elon

resed

LANI

WS

uary,

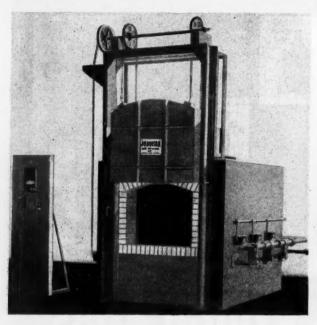
More and more, men who demand TOP efficiency and accuracy turn to T-J for Rivitors... hydraulic cylinders... air cylinders... cutters... Clinchors... and air controls for a wide range of requirements. Precise

standards of manufacture...plus careful inspection of all materials...are constantly guarding T-J Quality throughout production.

Our "tomorrow-minded" engineering staff and long experience are continually solving new problems for industry—do not hesitate to bring your Tough Jobs to T-J! Write for bulletins. The Tomkins-Johnson Co., Jackson, Michigan.

TOMKINS-JOHNSON RIVITORS...AIR AND HYDRAULIC CYLINDERS...CUTTERS...CLINCHORS





Outstanding fetures of the furninclude an electric ly-operated do which is said to min five seconds is to p automatical proportioning - ty control for autom cally regulating mace temperature stack damper positiand push-button electric ignition which said to light burn with complete safe

Di-Acro Shea No. 2

205

New

Ster

Chic

J. R.

918

Syra

Johnson Special Heat-Treating Furnace

The illustration shows a special heattreating furnace which has been produced by the Johnson Gas Appliance Co., 562 E Ave. N. W., Cedar Rapids, Iowa. The furnace has a maximum temperature of 2,000 deg. F. which it can maintain for constant operation, and is provided with a combustion chamber measuring 36 inches wide x 30 inches high x 60 inches long inside. The unit is lined with 5½-inch insulation and faced with 4½-inch insulating refractory.

To meet the demand for a shear walarger capacity than that of its Dishear No. 1, the O'Neil-Irwin Mfg. 0 306 S. 8th Ave., Minneapolis, Minn., placed on the market the shear she herewith, which is designated as a Di-Acro Shear No. 2. The unit has maximum shearing width of 9 inchand maximum capacity for 22 gasteel plate. Net weight of shear, 40 shipping weight, approximately 45 inchanges.

The Di-Acro Shear No. 2 can be quit ly arranged for shearing, squaring, at ting, stripping, or notching to extrem close tolerances all ductile and plia

The New Prince Lathe Grinding Attachment

For Economical, Low Cost, Precision Grinding . . .

Easy to set up, simple to use, and wide range for cylindrical grinding. Can be used on any standard make of lathe. Capacity varies with size of lathe. The PRINCE GRINDER may be the solution to your grinding problem; act now, write to

MID-CONTINENT MFG. CO. SIOUX CITY, IOWA At your service...contact your Dearborn Gage Company Representatives in these key cities:



Clutsom Machines, Inc. 205 E. 42nd Street New York, New York

8.5

has

inch

qui

plial

Sterling Products Co., Inc. 121 N. Jefferson Avenue Chicago, Illinois

J. R. Stewart & Associates 918 University Building Syracuse, New York General Tool Sales Co. 3945 N. Broad Street Philadelphia, Penn.

William Yaegher, Jr. 383 Hillside Avenue Hartford, Connecticut

H. S. Kartsher 3411 Perkins Avenue Cleveland, Ohio Harley E. York 2900 Dixie Drive Dayton, Ohio

W. H. Scheer 7430 Bruno Avenue St. Louis, Missouri

Machinists' Tool & Supply Co. 3690 Santa Fe Avenue Los Angeles, California

DEARBORN GAGE COMPANY

1 22032 BEECH STREET . DEARBORN, MICHIGAN riginators of Chromium Plated Gage Blocks metals and materials, including spring tempered metals, fabrics, plastics, leathers, rubber, and so on. The unit is said



Di-Acro Shear No. 2

to be particularly adaptable for rapidly producing accurate shapes in bimetals, sensitized materials, mica, varnished cambrics, fiber slot insulation, and other dielectrics and materials required in the manufacture of precision instruments and recording devices.

Both blades of the shear are of h tool steel, properly hardened and pered. Blades are accurately mand fitted and are provided with a range of adjustment for wear and ting control. In addition, blades an versible, thus reducing resharpent a minimum. Shear bearings are iron to hardened steel and steel bronze.

The Di-Acro Shear No. 2 is also a able as a power-driven unit comwith countershaft and motor, all med on rigid floor type stand. Vacutting speed drives within the cap of the unit can be supplied to a production requirements.

Temco Electric Furnace

An electric furnace designed for in the rapid and convenient heat ing of small metal parts for hardedrawing, tempering, normalizing, nealing, enameling, and so on, is being manufactured by the The Electric Mfg. Co., 332 W. 69th St., cago, Ill. The furnace, which is innated as the Temco, is also said to pletely fill exacting laboratory required.



48-HOUR Delivery of Plug Gages and our New Micro-Adjustable Snap Gages

In Sizes 1/4" to 4"
We also make Ring and Special Gages
OUR GOOD GAGES: Prevent Spellage

Speed-Up Operations Utilize Less Skilled Help Reduce Costs

Superfinishing of Hardened Steel Surfaces

Our Superfinishing Department also puts a highly perfected mirror-like Superfinish on large quantities of Shell Punches and other parts for war work control tors. If you make Shell Case Punches (UE-141, 147, 149, etc., or other larger smaller sizes) we will put a beautiful mirror-like Superfinish on them for wand bring them to size on close tolerances at much less cost than you can make common polishing job. Our amazing new finish will help carry your product in inspections with but little or no rejections.

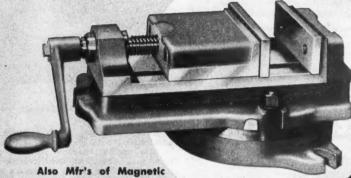
Quick service on Hard Chromium plating and re-sizing of worn Plug Gages.

EASTERN PRECISION GAGE CO

HERSH TOWER BLDG., BROAD ST.

ELIZABETH, NEW JEES

Swivel MILLING MACHINE Vises



Also Mfr's of Magnetic Chucks, Demagnetizers, Lathe Chucks, Power Hack Saws, Dividing Heads

85 LB. MASTER HEAVY DUTY 61/2" SIZE

\$32.55

Suitable for milling machines, drill presses, shapers, etc., these large semi-steel vises may be used plain or swivel. The steel jaws are sturdy. Key slots provide for attachment to machine table holding surface, with jaws at right angle or parallel to table. Junior 4½" size, \$23.60

L-W CHUCK CO.

20 N. ST. CLAIR ST.

TOLEDO, OHIO

of he

y gn th a and es an penin

are steel

to

d for eat to narder zing, n, is to St., is de id to a y req

10

es

Super

rger

make uct the

es. C O

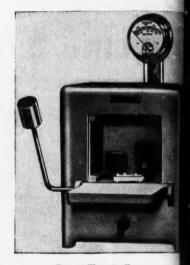
JERS

ments for testing and development work, precipitate drying, ashing, ignitions, fusions, and so on.

The entire body of the furnace consists of a heavy, one-piece casting, thus giving the unit sufficient strength to withstand hard usage, and is mounted on sturdy legs cast integral with the body. The door is counterbalanced for easy operation and fits snugly against the body to hold heat loss to a minimum. When opened, the door forms a convenient loading platform.

The muffle and heating element, which form the "heart" of the furnace,

are constructed and arranged to vide long furnace life. The heating ment, which is made with high qu Nichrome wire, is setup so as to connection with the electrical di



Temco Electric Furnace



The World's Best Rubberized abrasives for Fine Grinding and Polishing

Attach this advertisement to your card or letterhead. We will send you a free trial sample. Or if you prefer send \$1.00 for Special 33 wheel assortment.

CRATEX MFG. CO. San Francisco • Calif.

over the complete heating range, eliminating cold spots, and is embed in the muffle, thereby reducing on the muffle, thereby reducing on minimum. The muffle employs a prefractory material which is desito effect rapid heat diffusion yet wits electric insulating qualities at temperatures.

The Temco Electric Furnace is signed to operate continuously at peratures up to 1,500 deg. F. and imittently at temperatures up to deg. F. The furnace is available



GOOD MACHINE TOO INSURE PERFECT RESUL AND TOP PRODUCTION

Specify "QUALITY" H. S. Wood Keyway Cutters When You Haw Tough Job To Lick

QUALITY TOOL WOR

Makers of Quality Gears for 30 Years

linira

fine

ngag

n h

To mee

FAC

ma



niniratch—tiny reversible ratchet for intricate jobs—is but one of hundreds if fine forged Plomb Tools being supplied to war industries. If you are ngaged in mechanical war production the famous Plomb hand tool line an help speed your job—ask your Plomb Dealer to show it to you.

▽PLVMB ▽

Streamlined Tools
To meet war needs
31

31 FACTORIES make them

PLOMB TOOL COMPANY . LOS ANGELES, CALIFORNIA

d to

ange, s embe

tion is a sp

yet r

ace is

p to

Woods Have

VOR

three models designated as the G, GR, and GRP. Heat selection with the Models GR and GRP is through a heavy duty rheostat having a low range from 70 to 400 deg. F., medium range from 400 to 800 deg. F., and high range from 800 to 1,500 deg. F. Adjustable contact bands permit precise selection in any of three ranges. A fourth switch position allows for rapid heating of furnace to maximum temperature. The Model GRP is also equipped with an accurate indicating pyrometer calibrated in both Centigrade and Fahrenheit scales. Calibration is by 50-deg. increments up to





2,000 deg. F. and 1,100 deg. C.

The Temco Electric Furnace in signed for operation on either alte ing or direct current and can be tained for use with either 115 or volts. Power consumption is 1,200 The furnace measures 8% inches 13½ inches high, and 10 inches deep side. The heating chamber is 4 in wide x 3% inches high x 3% in deep. Shipping weight, 30 pounds.

Pec Self-Adjusting Jig Clan

A self-adjusting jig clamp which be locked in various positions up to deg. above or below horizontal is being marketed by Products Enging Co., 700 E. Florence Ave., Los I les, Cal., under the trade name of The wide range over which the



One cent heav Supp custo Spec

and -dr

with

Wor

Dist

and l

when be h you can f The

Pec Self-Adjusting Jig Clamp

can be automatically adjusted is a possible through the use of a sid aperture in the design of the d which has a function similar to found on a pair of pliers.

In addition to the self-adjusting ture, the Pec Jig Clamp is provivith a positive lock and is said to unusually quick acting.



nuary



One of America's prominent Manufacturers recently was able to start work immediately on a heavy Emergency Contract because he had a Mill Supply Distributor who specialized in helping customers to break down emergencies.

Specifications called for holes of "out" diameter and only special drills could produce them —drills that no manufacturer could deliver within weeks.

Working with the Purchasing Department, the Distributor finally reported: "take the contract and line up production as fast as you can. I know

where these millimeter drills can be had—plenty of them to keep you going until the factory itself can fill your order."

The contractor filled the War

job on schedule—thanks to the Distributor who knew his way around and had made his organization a helpful, friendly part of the Manufacturer's.

Think of your Distributor today as a trustworthy purchasing and expediting assistant, trained in emergency to contact many sources of supply and to locate somewhere the items you need, if they can be had at all.

Supply Houses of the highest type have served for years as Distributors of Cle-Forge High Speed Drills and Peerless High-Speed Reamers. Please accept our own confidence in them as ample

reason for our commending them to you - for they are located all over America and have been our Representatives for many years.

This incident is typical of the unusual services that many Mill Supply Distributors are rendering their customers during the Emergency.



mp

d is n

he d

r to

sting

provi

ATIC ENT

uary,

worded May 22, 1942 persoded July 13, 1942



TRACE GAME MESE I & PAY 20° AND FORCOL CONTREES

O BEARE ST. RIV YOUR. 9 NORTH JETSHESON ST. CHICAGO

SSIS SECOND BLVB, DETROIT SONDON - E. P. BARRUS, LTO. - 35-36-37 UPPER TRANSES ST. EAC





Awarded August 8, 1942

"CLEVELAND" DISTRIBUTORS EVERYWHERE ARE READY TO SERVE YOU

High Sustained Efficiencies Per Train···NOISELESS!



CHARACTERISTICS OF

ABART GEARS

All types, cut only to order for instruments, machine tools, and larger equipment. Long experience assures accuracy, and service. No stocks. Send B/P

ABART SPEED REDUCERS. Many types and sizes. Ask for Catalog.



GEAR AND MACHINE CO. Speed Reducers & Sears

4819 WIST 16" ST.

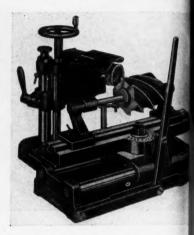


No extra man needed to steady— Roomy platform for men and tools. Great strength, lightweight. Guard rails on platform— Automatic locking. Folds compactly

Airplane spruce is u s e d throughout. Steel braces. Safety shoes. Sizes 3' to 16' in height—Ele-vating platform adds extra height to Dayton Ladders. Write today.

Hilco Universal Cutter-Grinde

Unusual flexibility, quick setting wide cutter range, compact design sence of vibration, and sturdy communications. tion are features claimed for the B Universal Cutter-Grinder now



Hilco Universal Cutter-Grinder equipped flat bed attachment set up for grinding is milling cutter

marketed by the Berco Mfg. Co., 42

Superior St., Chicago, Illinois.

The grinder is furnished comp
with interchangeable table or flat attachment and special universal in dividing head, and is said to grind perfect sharpness any concave, combelical, straight, tapered, angle or cial cutter up to 6 inches in diamand any saw up to 18 inches in diamand any saw up to ter regardless of cutting angle requir The dividing head has seven index cles consisting of micrometer play

New Nesting Type Tote Pan



20" long x 12" wide x 61/2" deep. 16 ga., drag holes and handles both end

J. L. LUCAS & SON, INC. Bridgeport, Conn.



VICTORIOUS POWER for America's Flying Fortresses... and for many another potent warplane...down the long assembly lines at Wright Aeronautical Corporation roll the mighty Cyclone "9's"! Here's bad news in big volume for the Axis everywhere!

On Wright's powered assembly lines high production is accompanied by high precision . . . and swift, efficient Snap-on Wrenches play an important part. Many of these Snap-on Tools are specially made or adapted for operations on the line.

The accuracy, flexibility and solid power of Snap-on Wrenches lend extra speed and precision to difficult jobs. From production and assembly line to maintenance shop and far-flung bomber base...wherever ships are built and flown and serviced . . . Snap-on Wrenches and Hand Tools have demonstrated their exceptional fitness for aviation's needs. Snap-on's 3,000 tools and direct-to-you service are conveniently near you through 35 factory branches at key aviation centers throughout the United States and Canada. For catalog, write -



SNAP - ON TOOLS CORPORATION

8032-A 28th Ave. Kenosha, Wisconsin

ow

compi flat

sal i

grind

, con

e or

diame

in dia

requi ndex

r pla

Pan

ep.

NC.



Close-up view of Hilco Unit Cutter-Grinder equipped with dividing head arranged for grin double angular cutter

Wilson "Bumble Bee" ! Welding Machine

Known as the "Bumble B an a.c. transformer type w ing machine which is said combine unusual safety of eration with improved ope ing efficiency is announced Wilson Welder & Metals Inc., 60 E. 42nd St., New I N. Y. An outstanding

ture of the machine is its low open cuit voltage of 42 volts, which is to be automatically and positively m

ained

Two primary coils are used in construction of the welder, with an netic contactor located in the circuit one primary. Each primary contutes approximately 42 volts to the topen circuit voltage, which is 84 to volts. When the machine is idle, here

holes or stops which are said to ensure perfect uniformity of cutting edges on the finished tool, regardless of the number of teeth or cutting surfaces.

number of teeth or cutting surfaces.

Designed for easy operation, the Hilco
Universal Cutter-Grinder is a bench
type unit which is arranged to occupy
a minimum of space. The machine is
21 inches long x 17 inches deep x 17
inches high and weighs approximately
135 pounds.



promp

IT'S NEW

ALCO
RELEASING TYPE
TAP HOLDER

d with for gri

Bee"

mble B type w is said

ety of ed ope ounced letals

New Y ding open ch is wely m

ed in

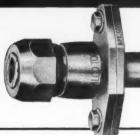
th a m

circuit

the

84 to

conf



Now ready — A Releasing Type Tap Holder for hand screw machines and turret lathes.

This new tool has been developed and perfected to meet the same rigid standards which are incorporated in the standard tools in the Alco line.

Two years have been spent in perfecting this new tool so that you can be assured of immediate reductions in operating costs and improvement in product quality.

Prompt shipments can now

Prompt shipments can now

Be made:

New Alco catalog No. 3

New Alco catalog No. 3

Illustrates and lists aware

illustrates and this new Re
illustrates and lists are illustrates and this new Re
illustrates and this

CHECK THESE SUPERIOR FEATURES:

- √ No bushings are required.
- Absolute concentric alignment on all work.
- Right or left hand threads are cut without any internal change in this remarkable tool.

ALCCFFDOLS

THE ALCO TOOL CO.

152 Birdseye Street

Bridgeport, Conn.

Detroit Office - 908 Stephenson Bidg.



Wilson "Bumble Bee" A.C. Welding Machine

ever, one primary is automatically cut out, restricting the open circuit value to 42 volts. As soon as the electrode contacts the work, the second primary is thrown into the circuit, thus provid-ing a voltage of 84-85 volts.

This open circuit potential of 84-85 volts enables the operator, when draw-

ADD VIMCOLIGHT On-the-Spot Lighting TO

FLUORESCENT Overhead Lighting

A most effec-tive combina-tion for encouraging still greater produc-

tion...for conquering eye strain...for reducing spoilage and fatigue. Designed by industrial lighting experts—non-glare, lexible VIMCOLIGHTS are standard equipment on hundreds of leading machine tools. Let us elaborate!

VIMCO MANUFACTURING CO. CHENANGO ST. BUFFALO, N. ing an arc, to establish his arc and begin welding. When weld completed and the operator pulls a lengthens his arc, the arc voltage The moment it reaches 85 volt contactor opens and cuts out on mary, leaving only 42 volts in the circuit.

56

TEI

ork o

Why

e wo

Why

is jo

ward

ere ba

perat

here

ull" c

Why

be

Power factor correction is pro with built-in capacitors on all four of the welder—300, 500, 750, and amperes—resulting in a power fact 100 to 86 per cent over the popular ing range. Capacitors are arranges to be cut out when the machine idle, thereby conserving power.

The Wilson Bumble Bee A.C.

ing Machine is of portable, stream design and can be easily passed the narrow doors due to a width inches. The machine has dual we connections for either 220 or 40 and is provided with thermal on protection by means of a cut-our located in the winding. A single wheel control permits an infinite ber of current adjustments to be throughout the N.E.M.A. range.

Bliss-Consolidated No. 9 Inclinable Press

Designated as the Bliss-Consolid No. 9, a 150-ton inclinable press Marquette pneumatic cushion has brought out by the E. W. Bliss 53rd St. and 2nd Ave., Brooklyn, I The press is of the geared type main working parts either end main working parts either end within the housing of the machin in guards provided for the safet the operator. The press is driven 15 h.p. motor which is mounted in the frame. Heavy removable tiel are used in front of the frame to duce deflection to a minimum. All bure he

ARTUS ARBOR SPACE and s The COLOR N



INDUSTRIAL PRODUCTS SUPPLIE Broadway New York,

MODERN MACHINE SHOP





ork on a 1020 carbon steel forging. Why 1/4" ball? To fit the shape of e work.

Why herringbone? For control. On type his job a single spiral would tend end would tend end ward "bur pull." Herringbone cut safet ere balances the opposing "pulls." iven perator can guide the bur exactly tle here he wants it . . . use any pres-All bure he wants. On jobs where "bur ull" doesn't matter, a single right Cill and spiral works excellently.

R to Why file cut? For maximum bur CNESTIfe, and to overcome "bur bounce."

A file cut bur bites through the tough skin of a steel forging.

On this type of job, best finish with maximum cutting power is obtained at speeds of 2800 R.P.M., varying with size of bur. After a file cut bur has been broken in, it should be used at slightly higher speeds.

Tip to operators: move the bur at an even rate and pressure. This eliminates the "hills and dales," providing a clean, scratch-free finish.

For burring counsel, resharpening service, and equipment, call on Kellerflex Sales Department.



pular

ge.

nsolid

ress has

Bliss yn, N

PRATT & WHITNEY

ivision Niles-Bement-Pond Company

West Hartford, Conn.



TO INSTRUCT NEW MEN IN THE HANDLING OF DIAMOND TOOLS

we will send you a valuable booklet. No charge, no obligation.

KOEBEL DIAMOND TOOL CO. 9450 Grinnell Ave., Detroit

KAEBELITE DIAMOND TOOLS

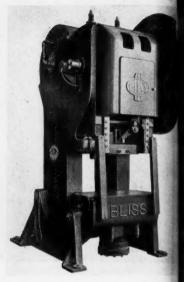
Multi-Point, Multi-Set, Multi-Edge, and Single Set. Diamonds for all Industrial Purposes.



 Pioneers in the riveting field. Head rivets from smallest to ³/_h" diameter, either by noiseless spin-ning or vibrating hammer method.—Sizes to meet all needs.—Types include Vertical and Horizontal Multiple Spindles.

> Write for literature-and don't forget to send samples.

THE GRANT MFG. & MACHINE CO. 96 Silliman Ave. Bridgeport, Conn.



Bliss-Consolidated No. 9 Inclinable h

ily loaded parts of the machine made of a special high strength material.

The Bliss-Consolidated No. 9 The Bliss-Consolidated No. 9 R can be inclined 39 deg. to permit a pleted work to fall by gravity a rear of the machine. Additional a features of the press include a sm faced, open-back, gap frame which mits strip stock to be fed either a to left or front to back; enclosed a ating mechanism, including clutch, wheel, and brake; clutch open valves; electrical controls, and sp counterbalance for slide. The design The the unit also includes a new type and cam-operated knockout slide w





18 x 39 inch SAMPLE \$485 Delivered Money-back Guarantee

by Reducing Fatigut VICTORY FLOOR MAlelt

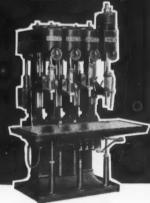
All

All wood, flexible, w clean.

ER PLACE - GRAND RAPIDS, HIS



FULL RANGE DRILL FOR WAR **PRODUCTION**



the design The No. 2 Footburt Sipp with back slide wear unit is a full range sensitive illing machine with correct speeds rall types of war work.

All eight speeds are obtained on R Maelt drive machines or on motor drive machines with standard single speed motor-no special motors are needed. The simple design provides wide speed range at the lowest cost.

THE FOOTE - BURT CO., Cleveland, Ohio Detroit Office: General Motors Building

FOOTBURT Sensitive DRILLING MACHINES



A simplified, precision tool for milling, boring, facing and rou uting small parts for instruments, arms and munitions in tool, die and machine shops.

Spindle dia. at driving end, %". 1150 and 1750 r.p.m., 5 speeds. 12" longitudinal travel of table, 7" cross travel. 4" spindle feed.

Write for folder.

A G & S Representative in all principal cities.







Order from your dealer or write direct. Request literature. No obligation.



is provided with a single adjustment the front of the press, thus eliminate necessity for setting correct knock position at the rear of the machine

Whitney-Jensen Bench Type Press Brake

To meet the demand for a small probable for moderate-sized win jobbing and production shops, Winey Metal Tool Co., 110 Forbes in



Whitney-Jensen Bench Type Press Broke

Rockford, Ill., has brought out the Winey-Jensen Bench Type Press Enshown in the acompanying illustration of the manufacturer, the wis powerful, extremely sturdy, fast, at to adjust, and accurate and include number of design features which mait unusually practical for perform bending and forming operations.

Specifications of the machine are follows: capacity, 14 gauge met strokes per minute, 72; stroke adjument, 1 inch; length of die bed, inches; throat depth, 61/4 inches.

G-E Alternating Current Combin tion Magnetic Starters

A line of alternating current comnation magnetic starters for full-volta starting of induction motors up to h.p. has been announced by the Genta Electric Co., Schenectady, N. Y. Anable in N.E.M.A. sizes 0 and 1, the magnetic consist of fusible motor-circuit switch

fo Back i

to the popularies to Today

opment, production

for metal bonded or Resinoid

bonded diamond wheels.



TAFT-PEIRCE has been a "Ground Crew" for the Aviation Industry

Back in 1911, Taft-Peirce produced the original Lougheed motor. Then, later on, Taft-Peirce tooled the motors which flew Lindbergh to France, Byrd to the poles... and many other famous names and planes to new records for speed and endurance.

Today, Taft-Peirce service to the aviation Industry encompasses not only tooling and development, but also the manufacture of special production machines... contract service in manufacturing parts or complete motors... and a line of standardized Air Service Equipment which includes propeller protractors, balancing stands, checking plates, reaming and boring equipment, standard and special gages. There is a publication describing each of these services; you may have any or all of them for the asking. Write to The Taft-Peirce Manufacturing Company, Woonsocket, Rhode Island.

TAFT-PEIRCE

* Serves the Aviation Industry *

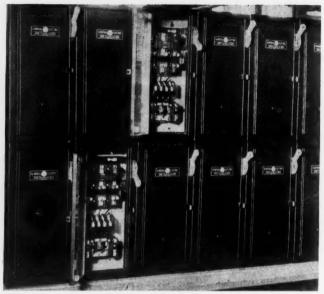
are i

bin

olta

to

unitch



G-E Alternating rent Combinati Magnetic State

and magnetic starters incorporated in compact cabinet-type all-welded steel cases. The flush-type doors of the cases close into deep L-shaped flanges, thus making unusually tight joints between cases and doors. Interlocks prevent doors from being opened until starter switches are in off position. To facilitate mounting of starters close together, the operating handles of the units are projected through the front of the cases rather than the sides.

The motor-circuit switches of the G-E Combination Magnetic Starters have silver-surfaced snap-action contacts of the roller type which are said to easily break stalled motor current. New Vystipe fuse clips hold fuses firmly in

place by mea screw fasten each end, thu suring good tact and pre ing fuses from displaced ing subjected to circuit conditi Starters can be obtained thermal cire breakers in of fusible m circuit switche desired.

The bimet overload relay the units are justable for a hand or autom reset and pu motors from a heating due to peated overload

sustained overloading, or too free starting. All terminals are of the type and are front connected. The ble-break contact tips are silver hand are of a self-cleaning type.

Clayton Boring Bar Holder

A line of boring bar holders for a swings from 8 to 36 inches is now ing offered by the Clayton Mfg. Alhambra, Cal. A feature of the Control Holder is a unique dual clamarrangement for separately holding ing bar in holder and holder to be

GRAY TURRET HEAD METAL CUTTER OR NIBBLER



GRAY, Originator of First Practical Metal Cutter or Nibbler

Most modern Nibbler for Template Cutting, Tool Rooms, Shipbuilding, Aircraft Parts, Aircraft Tubing, Sheet & Plate Shops.

GRAY MACHINE CO. Box 596, Philadelphia, Pa.

The BARNES Motor Driven Precision CUTTER GRINDING MACHIN

For Precision Grinding of Formed Milling Cutters used in the manufacture of rifles, eistols, etc.

GENERAL MACHINERY CORP. 140 Federal St., Boston, Mass. Telephone Liberty 4826



Hondary,

Qui you

Det

If to

pro

can

STAN

ACC

DIETUROITI DIE SETS *

Quick delivery from our large stock of standard die sets will help solve your production problems and the fine materials and workmanship in Detroit Die Sets assure you long and trouble-free service.

If today's shortages are affecting your output, write us regarding your

If today's shortages are affecting your output, write us regarding your problem. We are rendering valuable service to others. Maybe we can help you.

STANDARD DIE SETS in stock for immediate shipment
PRECISION DIE SETS • SPECIAL DIE SETS
ACCESSORIES in stock for immediate shipment
DOWEL PINS, SPRINGS, SOCKET-HEAD SET
SCREWS and CAP SCREWS

Write for catalog



DETROIT DIE SET CORP.

2895 W. GRAND BLVD. DETROIT, MICH.

mating ombination tic Start

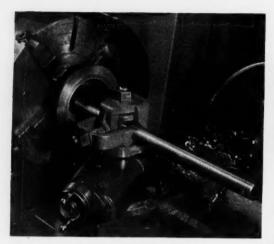
mean stene l, thu good i pres placed l to si conditi can ined circ in ; le m witch bimet relay are for e autom d pro om o lue to erload frequ he d The i er in

der

for h now Ifg.

he Cl

ling i



Clayton Boring Bar Holder

The use of such an arrangement en-ables the holder to be adjusted for alignment on the lathe or removed without disturbing the setting of the boring bar. As a result, the holder is said to be particularly useful in perior ing duplicate boring o

Boring bars, which are ly held to eliminate en and are quickly adjustable provided with 4-inch cations which are engrave each end of the bars for distance back from the holes, thus eliminating need for file or chalk m Tool bits are held in po by means of Allen thereby enabling them easily removed without de-

Anthony Cutting-Off

A line of cutting-off too engine and turret lathes in being marketed by the thony Tool Co., 233 Freder hung Ed. Sen Antonio To

burg Rd., San Antonio, Teatures of the tools include a piv trunnion and "safety-slip" which said to prevent chattering in mad damage to equipment, and breaks blades. According to the manufact

Eliminate Spoilage Losses In Tapping and Reaming!

The spoilage of parts because of inaccuracies in tapping, or because of holes being reamed oversize or bellmouthed, can now be easily eliminated.

The trouble, you will probably find, is due to the spindle being out of alignment with the work. The way to correct this is by using a Ziegler Floating Tool Holder—the holder that automatically compensates for such misalignment.

The Ziegler Holder always floats freely, without friction or cramping, even under the severest tool-driving strains, and takes any and all end-thrusts. This is why it eliminates spoilage losses, turning out work accurately to the finest of tolerances.

W. M. Ziegler Tool Co.

1920 TWELFTH ST. DETROIT, MICH.



there IS a difference in taps Maria de la company de la comp Somethin and the same take Structural Photograph STRUCTURE **Enlarged Four Times** for example: One reason Sossner taps last longer and cut more perfect threads is because the tap blanks have been heat-treated in time-tem-

perature-atmosphere controlled furnaces. All Sossner taps are precision ground from the hardened high speed steel stock!

TAPS AND GAGES OF AMERICAN NATIONAL AND BRITISH THREAD FORMS IN SPECIAL AND STANDARD SIZES

TAPS GAGES

t da

Off 1

es I

SOSSNER

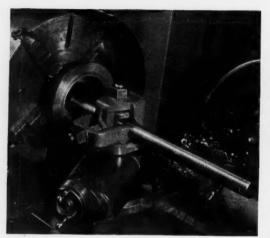
STEEL STAMPS CUTTING TOOLS

"32 year reputation for reliability and precision workmanship."

Write to SOSSNER, 221 Centre Street, N. Y., or 29 Broadway, Lynbrook, N. Y.

ry, I Danuary, 1943

MODERN MACHINE SHOP



Clayton Boring Bar Holder

The use of such an arrangement enables the holder to be adjusted for alignment on the lathe or removed without disturbing the setting of the boring bar. As a result, the holder is said to be

particularly useful in pening duplicate boring tions.

Boring bars, which are ly held to eliminate dand are quickly adjustable provided with ¼-inch cations which are engraveach end of the bars for distance back from the toholes, thus eliminating need for file or chalk more to both the company of allen so thereby enabling them teasily removed without dans to eliminate the company of the co

Anthony Cutting-Off 1

A line of cutting-off too engine and turret lathes is being marketed by the thony Tool Co., 233 Freder burg Rd., San Antonio, Te

burg Rd., San Antonio, T Features of the tools include a piv trunnion and "safety-slip" which said to prevent chattering in mad damage to equipment, and breaks blades. According to the manufact

Eliminate Spoilage Losses In Tapping and Reaming!

The spoilage of parts because of inaccuracies in tapping, or because of holes being reamed oversize or bell-mouthed, can now be easily eliminated.

The trouble, you will probably find, is due to the spindle being out of alignment with the work. The way to correct this is by using a Ziegler Floating Tool Holder—the holder that automatically compensates for such misalignment.

The Ziegler Holder always floats freely, without friction or cramping, even under the severest tool-driving strains, and takes any and all end-thrusts. This is why it eliminates spoilage losses, turning out work accurately to the finest of tolerances.

W. M. Ziegler Tool Co.



1920 TWELFTH ST. DETROIT, MICH.



Gegler Lance FLOATING HOLDER for Taps and Reamers

there IS a difference in taps. Market Little Land Control of the Co Somment and the same take Structural Photograph STRUCTURE **Enlarged Four Times** for example: One reason Sossner taps last longer and cut more perfect threads is because the tap blanks have been heat-treated in time-temperature-atmosphere controlled furnaces. All Sossner taps are precision ground from the hardened high speed steel stock! TAPS AND GAGES OF AMERICAN NATIONAL AND BRITISH

TAPS GAGES

H 1

SOSSNER

STEEL STAMPS

"32 year reputation for reliability and precision workmanship."

THREAD FORMS IN SPECIAL AND STANDARD SIZES

Write to SOSSNER, 221 Centre Street, N. Y., or 29 Broadway, Lynbrook, N. Y.

January, 1943

MODERN MACHINE SHOP

the tools can be readily operated by inexperienced workmen and are designed to make straight cuts, eliminating the need for refacing operations.

Anthony Cutting-Off Tools for engine lathes are known as the "E" series, with numbers indicating the maximum diameter of cut which should be made with each tool. Tools for large diameter cut-offs from 3 to 30 inches are made with a cutter blade of high speed steel supported by a blade of tempered spring steel. The support blade gives added strength to the cutter, thus enabling it to make large diameter cut-



DRILL THESE HOLES

By a Quick, Easy, Inexpensive Method Your business letterhead will bring literature. WATTS BROS. TOOL WORKS Wilmerding, Pa.



from Grinders with DUSTKOP
Quickly attached to any tool, cutter, surface or internal grinder... Operated by
GE or Howell motor and fan... Spunglass Oversize Filter stops dust and returns cleaned air to room... LOW
PRICED... Hundreds now in use in
War Work. Prompt deliveries on standard units with high priorities.

Write for Bulletin A-500

AGET-DETROIT MFG. CO.



(Left)—Front View of Anthony Model E40 ting-off Tool. (Right)—Rear View.

offs. Tools for small diameter cutare made without a supporting bla since such a blade is said to be necessary to prevent breakage of a ter blades due to the construction the toolholders.

Anthony Cutting-Off Tools for two lathes are known as the "T" series a also include numbers indicating maximum diameter of cut which she be made with each tool. As with "E" series, tools for large diameter cut-offs (4 to 12 inches) are made with supporting blade to give added strengto cutter. Tools for small diameter a offs (3 and 4 inches) are supplied with out supporting blade. Cutter blades all type and size tools can be ear removed for grinding.

Zagar Collet Chucking Fixture Ye are at

A line of collet chucking fixtures holding and indexing work on mach rode—tools is now being marketed by Zagon will be Tool, Inc., 23830 Lakleland Blvd., Clelland, Ohio. The fixtures are availabled more in two types—straight holding and his mount of



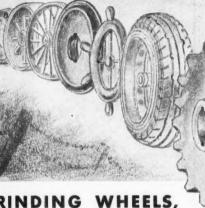
ow more

lection.

l passwo

rtain the





GRINDING

ow more than ever, demand the most careful lades lection. Conservation should be the ever-watchal password in every foundry, toolroom, factory inding department or machine shop.

cture we are at your command day and night, to make rtain that of the hundreds of arit — hardness ade — and porosity combinations, your selecon will be the one that will give you a greater Cles on win be the one that will give you a greater valle and more rapid production with the maximum nd hillmount of grinding efficiency at a minimum cost.



cutbe

mach

CONTROLLED POROSITY, FRACTIONAL GRADES, H9 VITRIFIED BOND, three of our many outstanding features, assure a definite start in this direction. Consult BAY STATE and be sure!

ABRASIVE PRODUCTS CO., WESTBORO, MASS. U.S.A.

ary, 1

30945



No. 4 Motor Driven MILLING MACHINE **Mounted on Cabinet Column**

Burke motor driven milling machines Nos. 1, 2, 3, and 4 are specially suited for handling small, difficult work on a production basis.

Write for complete information.

BURKE MACHINE TOOL CO. 297 E. 16th St. Conneaut, Ohio



Zager Indexing Type Collet Chucking &

ing and indexing—each of which is nished in 1 and 2-inch sizes for har work up to and including 1 and 2 is in diameter respectively. The fix are ruggedly constructed to with hard usage, with all parts hardened ground to precision limits, and are to be particularly useful in perfor tapping, spot-facing, drilling, and a terboring operations essential to production of munitions.

The Zagar Collet Chucking Fix employ a single handle for opening closing collet. With the indexing fixture, this handle also serves to in the collet. The index type fixture includes a stationary handle to hate indexing to full 360 deg. Both fixtures are designed to accomm. No. 2 and No. 6 W & S master collections. depending upon the size of fixture The fixtures can also be furnishe accommodate practically any type

Zagar Holding Type Collet Chucking R



huary,

MAS gineer ad pe andard des sp

not m

actical

MODERN MACHINE SHOP

January,

Put MASTERDRIVES n your **HEALD** Internal Grinders



work head speed over 1 to 9 rangeunusual control of finish

Infinite variation in



MASTERDRIVES on this Heald Grinder are specially gineered for the job. Speedranger-equipped work ad permits selection of exact speed for desired finish. andard precision balanced motor on wheel head prodes speed to suit the spindle. Independent pump drive not mechanically connected. Motorized feed drive for types of feed . . . MASTERDRIVES for all other makes grinders are part of 550 different specifications for actically any machine tool drive requirement. Each it is complete, easy to install, operate and maintain.

We'll send name of NEAREST

REPRESENTATIVE

and latest Masterdrive literature. WRITE TODAY !

STER Electric Company

DAYTON, OHIO NDUSTRIAL EQUIPMENT DIVISION

nuary, Manuary, 1943

MODERN MACHINE SHOP

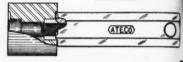
collet. A tapped hole provided in each fixture affords an inlet for pressure feed cutting oil, which rises through the collet, lubricating the work and cleaning off any chips.

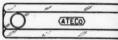
Three index plates for four, six, and eight divisions are included as standard equipment of the indexing type fixture. Other plates for divisions from 2 to 25 as well as for any staggered or unusual divisions can be furnished on special order. A convenient graduated scale is provided on the upper face of the body of the fixture. This scale is used when indexing is not required. On the 1-inch fixture, each graduation of the represents two degrees; on the fixture, one degree.

Ateco Metal Gage Handle

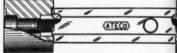
A line of single and double-end handles for plug and thread gar now being marketed by the Aurelio







Single end



Double end

Ateco Metal Gage Handles

zi Engineering Co., 430 Jefferson Brooklyn, N. Y., under the trade m of Ateco. Available in two types de nated as Taperlock and Trilock, handles are made according to American Gage Design Standard are interchangeable with any make

Ateco Metal Gage Handles are plied in sizes from to 11/2 to 11/4

TURRET TOOL POST

Hardened throughout, self-compensating for wear, precision built. For top production on small South Bend, Sheldon, Clausing, Atlas, Logan and similar bench lathes and small screw machines.



F & M SALES COMPANY, HOLLYWOOD, C Manufacturers and Selling Att

ANTI-FRICTION COMPOUND SPEEDS UP

Motor-Mica will solve your toughest lubricating problems. Prevents

Threading, Boring,
Die-Casting, Tapping,
Screw Machine, Cools HOT BEARINGS.

Stamping, Turning, Drilling, Milling, Other Operations

Packed in 5-10-25-50-100 lb. Containers Write for free sample!

SCIENTIFIC LUBRICANTS COMPANY

3462 N. Clark St., Chicago, III.

Milling Machine Vises

PLAIN OR SWIVEL FOR ACCURATE MACHINING



SEND FOR CIRCULARS

JOHN B. STEVENS INC.

482 Canal St. New York, N. Y.

MODERN MACHINE SHOP

January,

anuary,

Vhy c

Gushe

ures (

fficie

De

tor

pu "kr

ope

lea

use

nee

THI

1817

LARG



GUSHER COOLANT PUMPS

Why accept a substitute? Only patented Gusher Pumps give you the exclusive features and advantages you need for most efficient production.

Designed and built by the originators of the Vertical Packless Motor pump, the Gusher line today is "known" for dependable, care-free operation.

Gusher Pumps are favorites among leading machine tool makers and users. There's a Gusher to fit your needs. Write!

THE RUTHMAN MACHINERY CO.
1817 READING ROAD, CINCINNATI, OHIO
LARGEST EXCLUSIVE BUILDERS OF COOLANT PUMPS



This new Gusher has a large mounting flange so as to be interchangeable with larger Gusher Pumps. Right or left discharge, 1/10 H. P. Capacity: 10 g. p. m.

the a

ndles end n

rson i

lock,

lard a

are

D, d

Jary,



Mt. Vernon, N. Y. Dep't. D3 *Trade-Mark and Pat. No. 2,131,657 of M. A. Ferst, Ltd., Reliance Pencil Corp., Licensee

emplar DURO Lead PENCILS



e Three grades of diamonds. Common quality \$12 per karat. Medium quality \$24 per karat. Select quality \$48 per karat. (Contour template diamonds supplied only in Medium and Select quality.)

All diamond sizes ¼ to 10 karat are nib mounted for immediate shipment. .. Billed subject to approval. Specify quality of diamond wanted. We recommend a minimum size of one karat for each 6' diameter of grinding wheel. (24 hour resetting service, \$1.00 post paid.) Send spesifications and prints for prices on turning and boring form tools.

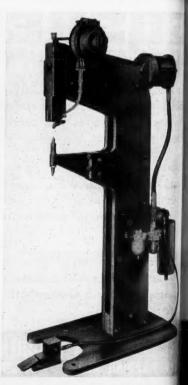
DIAMOND TOOL COMPANY, Not Inc. Shelden M. Booth, Pres. CHICAGO, ILL.

inches and are designed to accome date gages above 0.029 inch up to including 4.510 inches.

T-J Air Powered "Rivitor"

Especially designed to speed up i riveting in aircraft production, the Air Powered "Rivitor" illustrated with, product of The Tomkins-John Co., 620 N. Mechanic St., Jackson, 16 is equipped with automatic feed setting mechanism and has a cap for rivets ¼ inch in diameter x ¾ long. The machine is available in the depths ranging from 9 to 36 inches using a different type of rivet set rivet jaw construction, the machine also be adapted to handle counter head, round head, and full semi-bn head rivets.

Pressure for riveting is furnished



T-J Air Powered "Rivitor"

268

TO'

BALL AGAI SIVES

I

PROVI

ELECTRIC MOTORS and DRIVES





TYPE EA

accom

p to

tor"

the ted is s-John on, Market in the ches.

chine

unten mi-bra

nishei

FAN COOLED 1 TO 15 H. P.



PROMPT DELIVERY

Reasonable deliveries can be made on both TORQ on OTORS and TORQ - QUA-MATIC DRIVES to plants with priority ratings.

BALL BEARING — STEEL BUILT — SEALED AGAINST HARMFUL OIL CHIPS AND ABRA-SIVES — MADE FOR REAL PRODUCTION

TORQ-QUA-MATIC

DRIVES

FOR MACHINE TOOL CONVERSION

- A 4 SELECTIVE SPEEDS
- B SIZES 1 TO 15 H. P.
- C ALLOY STEEL GEARS
- D ANTI-FRICTION BEARINGS

PROVEN DESIGN — IMPROVES PRODUCTION UP TO 25%





Send for FREE descriptive literature containing complete details and specifications on TORQ MOTORS and TORQ-QUA-MATIC DRIVES.

THE TORQ ELECTRIC MFG. COMPANY

an air cylinder and is stepped up and applied through a toggle mechanism. Upper and lower toolings of the machine are accurately aligned and are said to remain such regardless of the amount of vertical adjustment of the lower tooling. Additional features of the unit include adjustable setting tools for accommodating various thicknesses of materials and interchangeable horn type construction which permits horn section holding lower tooling to be removed and replaced with horn section from any other RP and RS interchangeable horn type Rivitor.



WADE ENVELOPES

protect Shop Orders, Drawings, Blueprints, Etc.

Made in three styles, transparent, fibre, and metal backs. Non-inflammable acetate windows. Special style or size to order. Write for details.

WADE INSTRUMENT COMPANY

Phone: CEDAR 4728 1422 E. 109th St., Dept. M., Cleveland, Ohio



Service Revolving Crane with Trolley Hoist

Illustrated herewith is a revolvi crane with trolley hoist which is a being offered by the Service Caster



Service Revolving Crane with Trolley Hois

Truck Co., 440 Somerville Ave., Som ville, Mass. The unit is provided will a maximum boom overhang of 4 fa from center of trolley to side of crain and has a capacity of 4,000 lb. will center of trolley overhanging side base 36 inches and 2,500 lb. with cent of trolley overhanging side of base inches.

The crane features an overall heigh



MODERN MACHINE SHOP

January, Il Couary, 1

pos mas the

the

For greatest production from Carbide Tools



● In addition to the proper handling of carbide tools on boring, turning, and facing operations, it is necessary to choose the correct grade of KENNA-METAL for the specific job to get the greatest possible production.

Check the grade on the tool shank; this grade marking appears on all KENNAMETAL tools. If the tools are being made in your own plant, have the tool maker indicate tip grade on all shanks.

Using the wrong tool grade may mean unnecessary tip wear, a broken tool, or less than capacity production. To be sure the grade is correct for the job, consult your Vest Pocket Manual, or KENNA-METAL Catalog No. 43.

KENNAMETAL is made in four standard grades of hardness.

USE GRADE KM for the majority of jobs where a strong, durable tip is required, as in machining alloy steels and carbon steels above .35 carbon, of hardnesses up to 550 Brinell. USE GRADES KH and K3H on scale-free, continuous cuts or where material being machined is very soft, as in SAE 1020, or free machining steels. On extremely hard steels (above 400 Brinell) it is advisable to use KH or K3H for resistance to edge wear.

USE GRADE K3H or K4H on precision boring or on continuous cuts where extreme wear resistance is necessary; use only K4H on non-ferrous metals, such as bress, bronze and light alloys.

Characteristics of the Four Grades of KENNAMETAL

Grade	Reckwell A	Rockwell	Strength Transverse Rupture Lbs./Sq.In.	Thermal Conductivity cal./°C. cm./sec.	
KM	90.8	77.6	305,000	.113	
KH K3H	91.3	78.6	275,000	.074	
K4H	92.5	80.6	225,000	.110	

Write for your copies of the Vest Pocket Manual and the new McKenna Catalog No. 43.

* INVENTED AND MANUFACTURED IN U. S. A.



with

revolvi

is n

y Hois Some

4 fe cran b. wit side

cent

base

heigh



ry, 10 cauary, 1943



A "Free Wheeling" Clutch of simple design recognized for many years as "Standard Equipment for Automatic Dual Drive Operation – Automatic operation of 2 speed drive – As a ratchet permitting infinite adjustment and as an automatic backstop. Furnished in a number of types.

THE HILLIARD CORPORATION

HILLIARD CLUTCHES



of 12 feet and is provided with a hook of 9 feet. The base of the utility 4 feet wide and approximately 6 inches long overall not including wheels of the crane are 8 inch diameter. Weight of unit, approxil 19 5,500 pounds.

10

ven Vo

eases s

s com

plies t

bide cu

cket de

y-just

u're rea

es. See nts and

uary, 1

Nichol Vernier Attachment Bridgeport Turret Millers

A vernier attachment which or quickly installed on all Bridgeport ret Millers without the need for a machining has been placed on the ket by the Nichol Machinery Co.,



Nichol Vernier Attachment Applied Bridgeport Turret Miller

7th St., Milwaukee, Wis. The lor dinal scale of the attachment is med in brackets attached to the from the machine and the vernier is ported in a bracket attached to saddle. The transverse scale is most in brackets fastened to the side of knee, with the vernier located is bracket attached to the saddle.

By means of the Nichol Vernist tachment, many jig boring jobs in ing close tolerances of plus or 0.002 inch can, it is claimed, be quand accurately performed on a Broport Miller. When not in use, the tachment can be quickly removed.

Di-Acro Brake No. 3

According to an announcement by the O'Neil-Irwin Mfg. Co., Msth Ave., Minneapolis, Minn., the Acro Brake originally described in

JOE"

ich e

for s

Co.,

e lon

is m

ed to

s mou

ide of ted i

bs re

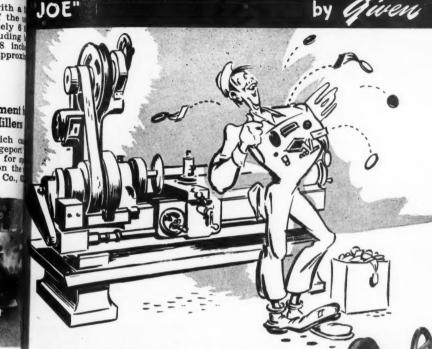
e qui

3

ent I the

d in

uary,



plied pe's Gettin' All The Production Medals Now

YOU want peak production from old tools doing war work, the ven Vari-Speed Drive can help!

 ${f r}_{is}^{rw}$ reases spindle speeds on older machine tools 30% or more, yet s not sacrifice slow speeds. Convenient handwheel control proes complete stepless speed range without stopping machine. plies those extra r.p.m. needed for efficient production with ernier voide cutters . . . often doubles original machine output.

or macket designs are available for any machine tool. Installation is by-just drill and tap four bolt holes, bolt the bracket in place, and the burre ready to go. Given Vari-Speed Drive is made in 1 to 10 h.p. ved. tes. See the Given today—and write for bulletin, installation blue-Ints and recommendations.

VARI-SPEED DRIVE

GIVEN MACHINERY CO., 3855 SANTA FE AVE., LOS ANGELES

uary, 1943

MODERN MACHINE SHOP

273



Di-Acro Brake No. 3

February, 1942, issue of this magazine and later as an improved unit in the September issue is now available in a larger model. The new unit, which is designated as the Di-Acro Brake No. 3, is of similar construction to the previously announced brakes.

Specifications of the Di-Acro Brake No. 3 are as follows: maximum folding width, 18 inches; maximum full width folding capacity using both handles, 24 gauge steel plate; maximum folding capacity to 12-inch width using both handles, 18 gauge steel plate; maximum degree of angular folding, 110; net weight, 200 lb.; shipping weight proximately 225 pounds.

Gast Explosion-Proof Rotary Motor

A rotary air motor which is a be especially suitable for local where compressed air is available

where explosionproof equipment is essential is an-nounced by the Gast Mfg. Corp., 137 Hinkley St., Benton Harbor. Mich. The motor is said to be particularly applicable to war-production jobs, such as driving mixing equipment in munitions plants, and so on.

Outstanding fea-tures of the Gast Explosion - Proof Rotary Air Motor



Gast Explosion Rotary Air Me

actual to up on Ta k Turr

Enc

del"S"-Fo

he new nall scre

here are urret To

ead can

bund. Ir ating all cond o

8 N N

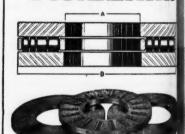
include variable speed over a widen elimination of reciprocating part springs, automatic take-up for

The "HOUSE OF PRECISION" Jansson Goge Blocks-a good standard for precision measure. ment. Used by leading armaments manufacturers. Preferred by experienced inspectors for their extreme accuracy. JANSSON GAGE COMPANY DETROIT . MICHIGAN

Write for

Literature and Prices.

19214 GLENDALE AVE.



TYPE RT

THRUST BEARING

· Made with flat seats and in a variety self-aligning types. These bearings are especially adapted heavy loads at slow or moderate spec

Standard sizes are shown in our general catalog, sent upon request.

THE GWILLIAM 358 FURMAN ST. BROOKLYN, I.

MODERN MACHINE SHOP

274

January,



runs that come through regularly, or for relieving turret lathes. Holds six tools and comes complete with tapered arbor that fits in tailstock. Can be had with straight

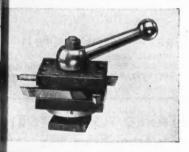
shank for increasing tool hole capacity on turret lathe. Tool

holes are bored, after arbor is fitted to insure accurate centering of tools. Saves time in tool changing and chucking. Quickly pays for itself. Recommended by many users. Order from your dealer or write for circular.

Model "A"-21/2" d.a. with No. 1 or No. 2 Morse Taper arbor and 6 bored 5% tool holes \$18.95

Model "B1"-5" dia, with 1" straight shark arbor and 6 bored 1" tool holes, for use on Turret

Enco Turret Tool Posts-for Bench and Small Engine Lathes



is 89 loca ilable

osion-

iden

part for 1

TING rriety

speed

actual tool

up on an CO Mod-"B" Tail-

k Turret.



del "S" - Four tool, 8 position Turret Tool Post 2 1 " sq... \$23.00

Model "H"-Six tool, 12 position Turret Tool Post, 3" Hex. \$25

he new "ENCO" adjustable Turret Tool Posts for Bench and small Engine lathes and nall screw machines are carefully engineered lathe accessories that have many advantages: there are two positions for each tool, giving 6 and 12 positions on the Four and Six tool, urret Tool Posts, respectively. Take standard square tool bits and boring tools.

Lead can be raised or lowered to center tools. Turret is rigidly mounted in T-slot of comound, Indexing is easy, accurate and positive. Indexing mechanism is self-contained, eliminating all possibility of chip interference. Case-hardened steel construction. Eliminates many econd operation set-ups. When ordering, give make of lathe and swing.

& N Manufacturing Co.,

Dept.D .,

3321 Montrose Ave...

Chicago, Ill.

low maintenance, positive starting in any position, and unusually compact construction. Designed to deliver from 1/20 to 1 h.p., the motor is equipped with ball bearings throughout and all parts are accurately ground. Self-adjusting seals are used for shafts.

Eastern Plug and Snap Gages

Eastern Precision Gage Co., Hersh Tower Bldg., Elizabeth, N. J., is now marketing a line of plug and Micro-



Cut Set-Up Time
75% through use of the
New Advance Clamps
(the only T-slot clamps)
Clamp directly over
work. For use on all
machines with T-slots.
Standard and HeavyDuty type.

Write for circulars.

ADVANCE MACHINE WORKS 3727 Weisser Park Fort Wayne, Indiana

Hand Cut ROTARY FILES
High Carbon and High Speed Steel.



CONN

Adjustable snap gages. The plug gages can be furnished in go and no go progressive types and are readily as



Eastern Micro-Adjustable Snap Gage

able in ¼ to 4-in. sizes. According to manufacturer, all plug gages are 8u finished to an exceedingly perfect ror-like finish and are made in the lowing degrees of precision: "X" 0.00004 to 0.00010 inch; "Y" 0.00007 to 0.00015 inch, and "Z" 0.00010 to 0.00020 inch.

Eastern Micro-Adjustable Snap G



Eastern Go and No Go Plug Gage

are readily available in sizes from \(\) 4 inches and have adjustments \(\) approximately \(\) \(\) inch, depending \(\) the size.

Empco Improved Leveling Jad

Enterprise Machine Parts Corp., Jerome Ave., Detroit, Mich., announthat its Empco Leveling Jack for

GEARED FOR VICTOR

BEVEL — HELICAL SPUR — WORM



THE TAYLOR MACHINE CO.
1917 EAST 61st ST.
CLEVELAND ON

"TAYLOR - MADI

STRATFORD

CLO

Your

treat

to g it is Fo

or fi

CI

new elimi M your

acet



CLOSE CYLINDER VALVE WHEN SHUTTING DOWN

Your regulators are built to give long service but careless treatment shortens their life. It's only sound common sense to give mechanical apparatus the best of care, and today it is essential because replacements are scarce.

For example, always close the cylinder valve when shutting down for long periods. Even if it's only for four or five hours, this precaution removes needless strain on the regulator seat.

Closing the regulator adjusting screw while setting up a new job is another way to prevent unnecessary wear. This eliminates useless pressure on hose and torch valves.

Make yourself a Waste Warden! Take good care of your apparatus - keep every cubic foot of oxygen and acetylene working for America's smashing victory aheadl



THE WASTE WARDEN says:

DO check your hose and

connections for leaks. DO keep tips clean and free from carbon and slag.

DON'T use excessive pressure.

DON'T use oversize tip.

DON'T leave torch burning when not in use.



60 EAST 42nd STREET NEW YORK, N. Y. IN TEXAS

AAGNOLIA - AIRCO GAS PRODUCTS CO.





DLE CYLINDERS ARE PRODUCTION SLACKERS: Keep em tolling for victory!

Z"

rom 4

ts up

ing

g Jad

orp.,

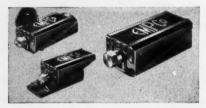
nnous

for

OR

DI

chine tools, special machinery, industrial furnaces, large surface plates, large assembly fixtures, toolroom and production equipment, and so on, has been improved. According to the manu-



Empco Improved Leveling Jacks

facturer, the jack is now designed so as to align itself to the most uneven floors. The upper casting of the unit is provided with ground slipways to minimize friction at point of contact with machine base.

Additional features of the improved jack include a positive two-way adjustment with increased limits. To level a machine, the upper casting of the jack can be readily operated forward or backward over the lower casting by simply turning the hexagon headed



SAVES LABOR

You will eliminate many costly hours from your Payroll by using the JACKSON TIME-SAVING VISE. It saves the time wasted by your Machinists in hunting for Bolts, Clamps, Angle Plates, etc., when rigging up work on the Drill Press, Miller, etc. Of still greater importance is the saving in output you effect by set having your productive machine standing idle during the rigging up process, for the—

JACKSON TIME-SAVING VISE

by means of its revolving jaw and supplementary jaws instantly holds the thousands of shapes that arise in machine work.

SEND FOR BULLETIN No. 23-M.

BROWN
ENGINEERING CO READING. PA

screw of the unit with a wrench, to obtaining a micrometer-like adjustment

The Empco Improved Leveling I is available in three sizes; namely, 1 (small), No. 2 (medium), and Na (large). The No. 1 jack has a non height of 2 inches, width of 2% inches, normal length of 4½ inches, and justment of ½ inch. The No. 2 jack a normal height of 2% inches, width 3 inches, normal length of 6½ inches and adjustment of ½ inch. The Na unit has normal height of 3% inches, the normal length of 4 inches, normal length of inches, and adjustment of 1½ inches, and inches, and adjustment of 1½ inches, and inches, and

H-P-M "Fastraverse" Deep Met Drawing Press

The Hydraulic Press Mfg. Co., Mr. Gilead, Ohio, announces the product of an unusually large self-contained the press to be made to the H-P-M "Fastraverse." Principles of the pressure features include a disparation of the pressure capacity and hydraulic cushion in press bed with 1,000-ton pressure capacity and the pressure capaci

sure capacity.

The frame of the press consists a cast steel head and bed spaced by pair of cast iron uprights. Two loaded tie rods passing through a upright lock the assembly togethe one solid unit. The uprights are arately aligned with head and bed special circular keys. The head is porates a hydraulic cylinder with poram which actuates the main if this slide is guided by beveled won the four corners of the uproper through adjustable gibs so positions to prevent any twisting of the sillar the H-P-M Fastraverse Press is

The H-P-M Fastraverse Press is pable of drawing heavy steel plate depth of 18 inches. More than drawing operation may be required, pending upon the thickness of the mand the reduction required. Accord to the manufacturer, the press may effectively operated with varied leng of stroke and at full pressure caps for any distance. Also, with die to ion idle, the press can be used for in action pressing, such as coining, sist straightening, and so on.

Only one hydraulic pump is requite operate the machine. Oil trapped the die cushion cylinder is intendin pressure by the downward at movement of the main press slide. Intensified pressure produces the mance force necessary for holding

SOARIAN partan

ry, Manuary, 1943

Met

MODERN MACHINE SHOP 279

SHIPPED THE DAY YOUR ORDER RECEIVED!

Why wait for machines? This 10" Lewis Shaper shipped immediately as plain or semi-finished castings, on low priority. Complete the balance of work in your own shop... save TIME... Save MONEY. Cost — 1/5 usual price.

Write for quotation.

naper ely as ished riority.

MACHINE TOOL CO. CONTROLL TO THE PROPERTY OF T

P. O. BOX 116, STA. A, LOS ANGELES, CALIF.

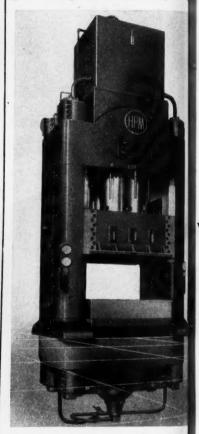


speed and more speed in the production of interchangeable parts requiring milling of any contour or outline is yours in the MOREY 12M. Provision for increased clearance between spindles and table.

Ask for Bulletin 680-A

MOREY MACHINERY CO., INC. 410 Broome Street New York, N. Y. blank. No compressed air or other side pressure source is required to erate the die cushion.

The use of a compound press permits two main slide pressure it to be employed; namely, a medium sure range up to 1,000 tons and a pressure range from 1,000 to 3,500 These two pressure ranges can be plied in sequence during the press



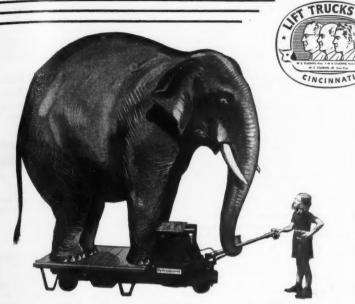
H-P-M "Fastraverse" Deep Metal Draws
Press

or independently as desired, thus m ing the press useful for forming a w ety of parts, both large and small. The closed circuit operating system

The closed circuit operating system the H-P-M Fastraverse Press provi for complete and accurate control all ram movements without an open

Stuebis

nuary,



With the Greatest of Ease!

A mere child can move "Elephant" loads easily—quickly—safely—with the HydroLectric made only by Stuebing at Cincinnati.

If "tough" loads like this can be moved, think how easy it will be to move your regular loads with HydroLectrics. Consider these features:

- 1—One man moves four times as much in a day as he can with any hand pulled truck. Saves up to 80% of material moving costs.
- 2—Daily power costs only 9c. Pays for itself as much as twelve times a year.
- 3—The HydroLectric costs only 1/3 and weighs only 1/3 of other power trucks of equal load capacity.
- 4—Records of 12 years of eight hour day service in America's largest industries. Write today for its interesting story.

LIFT TRUCKS, INCORPORATED

W. C. STUEBING, President

2425 Spring Grove Avenue, CINCINNATI, OHIO

Stuebing also manufactures hand lift trucks (not motorized) in capacities up to 8000 pounds.

Drawin

us m

g a n nall. ystem

prov

ntrol

ope

Jary,

press sure medium and a 3,500 can be

press

ing valve. Smooth and shockless reverse movement of ram is accomplished by reversing the delivery of the H-P-M Hydro-Power radial pump. Means are provided for operating the press in any one of three different ways-manually, semi-automatically, or fully automatically. Change-over from one type of operation to another can be quickly made by operator at electric push-button control station.

The H-P-M Fastraverse principle of press operation provides for prefilling and exhausting of the main cylinder during rapid traverse ram movements. Direct connection between overhead oil tank and main cylinder is provided through a valve built into the cylinder head, thus assuring complete prefilling of the press cylinder without cavitation.

General specifications of the H-P-M Fastraverse Deep Metal Drawing Press are as follows: pressure capacity of main slide, 3,500 tons; pressure capacity of die cushion, 1,000 tons; daylight between slide and bolster, 72 inches; maximum ram travel of main slide, 36 inches; maximum ram travel of die cushion, 18 inches; maximum shut height of slide, 36 inches; ram speedsclosing, 355 inches per minute; pressing

to 1,000 tons, 53 inches per m pressing from 1,000 to 3,500 ton inches per minute; opening, 355 per minute; motor required, 20 720 r.p.m.; shipping weight, 521,

SAI

FIV

Hexacon Hatchet Type Indus Electric Soldering Iron

The Hexacon Hatchet Type Indu Electric Soldering Iron shown is



accompanying illustration is now in offered by the Hexacon Electric Co. W. Clay Ave., Roselle Park, N. J. iron is of well balanced design, facilitating the performance of a

Modern war production requires precision machine tools. Shape-Rite Shapers meet all precision requirements in defense work. Before you purchase a shaper for your needs, investigate the specifications of the Shape-Rite Shaper. See your dealer or write us for further information.



U. S. A.



January,

3 Hy

t Cut

acity

invary,

swive

SALES SERVICE & MFG. CO. Announces — FIVE NEW KELLER POWER HACK SAWS

3C

per m

d, 200 t, 521,0

Indus

Iron

own is

e Indu

now heric Co. N. J. esign, 3C WET CUT SAW
With Coolant System.
Capacity 6¼ x 6¾ inches.
Vise swivels to 45 degrees.
Length of blade, 14 inches.
Automatic lift on reverse stroke.

3A—Capacity 6¼ x 6¼ inches. Vise swivels to 45 degrees.

Length of blade, 12 inches.



3B—Capacity 6¾ x 6¾ inches.
Vise swivels to 45 degrees.
Length of blade, 12 to 14 inches.
Automatic lift on reverse stroke.



No. I Bench Model
Capacity 4 x 4 inches,
Swivel vise, automatic stop.
Length of blade, 12 inches,
Motor, 1/4 H.P. 60 cycle, I phase.

O3 HY DUX



a. 3 Hy Duty
of Cut
pacity 6% x6%.
e swivels to 45 dees.
pacity at 45 degrees,
inches.
ith automatic safety stop.
ngth of blade, 14 inches.
o speeds available by shifting
lts on Y-belt pulley.

ot lift for saw frame. ed pressure regulator. Write
SALES SERVICE
& MFG. COMPANY
473 N. Cleveland Ave.

Saint Paul - Minnesota Or See Your Nearest Dealer

ing operations and reducing operator fatigue to a minimum. The tool is Underwriters' approved and is said to meet the requirements of all Government specifications, including Navy, Air Corps, Signal Corps, and Treasury specifications.

The Hexacon Hatchet Type Industrial Electric Soldering Iron, which also features replaceable elements, is made in wattages of 80, 100, 150, 175, and 200 and is available with plug type tips of %, ½, and % inch in diameter.

Castolin Eutectic Welding Alloys Nos. 14 and 140

As substitute for bronze or brass As substitute for bronze or brass welding rods owing to the scarcity of the copper and zinc employed in these rods, Eutectic Welding Alloys Co., 40 Worth St., New York, N. Y., is now introducing two welding alloys, designated as Castolin Eutectic Welding Alloys Nos. 14 and 140, which are companied weather less than 140, which are companied westly of iron and other less than 140. posed mostly of iron and other less scarce metals. Especially designed for use in the salvaging and repairing of iron castings such as machine compo-nents, casings, gears, pulleys, and so

on, these alloys are said to bind flow at temperatures from 950 to 1 deg. Fahrenheit.

According to the manufacturer, of tolin Eutectic Welding Alloys No. and 140 can be successfully empl by unskilled operators. Welds produced by the alloys are said to be invited and, it is claimed, can be galvant or hot porcelainized without being

American Wet Disposal Unit wi Screw Conveyor Feed

vith

on of ow-spe

nd from e High as man atures. his new ple spin ad rais

American Foundry Equipme Co., 555 S. Byrkit St., Mishawaka, h Co., 555 S. Byrkit St., Mishawaka, hannounces that a screw conveyor been added to its wet disposal unit or of orderice which is designed to make at sludge of the dust discharged from ower-fer hoppers of dry type dust collector is to centrifugally mixing the dust will ower-fer water or other liquids. This union ry for said to be accomplished almost insure was: The with the result that there is no service. ly, with the result that there is no was: The strength of the dust to disperse into atmosphere. The screw conveyor is a custo signed to provide a constant and in this que form rate of feed of discharged

STACKING BOXES in the unusual street in the



FOUR STOCK

Orderly storage of parts in convenient, all-welded, stack boxes saves valuable production time.



Bench legs of 14 ga. channe iron, all-welded joints. May we quote on your standard or special requirements?

FACTORY EQUIPMENT CO.

183 CHARLES ST." PROVIDENCE, R. I.

anuary,

How to increase production **U**ui

vith these NEW DELTA POWER FEED DRILL PRESSES

irer, 0 employ produ

invisi alvani being

nit w be

quipm aka, li

aka, he eyer to ucan get more output from the same numil unit, or of operators by utilizing low-cost DELTA
from ower-Feed Drill Presses. They permit operasection is to perform additional jobs while the
st willower-feed works automatically and quickly
union ry for themselves. And here's important
instrayers: These new Delta Power-Feed Drill
s into
the customary price ranges for drill presses
and withis quality.
ged the ged d

Many Outstanding Features

ne unusual design of the Delta Power-Feed nit, which operates directly off the bottom ive of the motor instead of off the spindle, akes possible a wide

nge of feeds, from .0010 .016 inches per revoluon of spindle in the ow-speed drill presses nd from .0005 to .009 in e High-speed machines. as many other special

atures.

his new line includes single and mulple spindle 17" units, in slow speed and
gh speed models, with table raising or
sad raising mechanisms, powered with either
elta or standard NEMA frame motors.

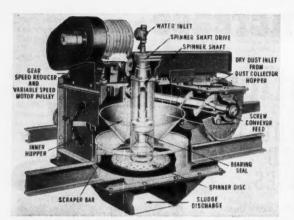
Write for Special Bulletin Ask your nearest Delta Industrial Distributor for specifications and prices or write direct to us.



THE DELTA MANUFACTURING CO. 602-A E. Vienna Ave., Milwaukee, Wis.

Please send me Special Bulletin on the new line of Delta 17-inch Power-Feed Drill Presses.

Address.....



Cutaway View of American Disposal Unit Showing Construction

time that the dust en the unit, water or other uid is discharged at the ter of a high speed min disc, thus effecting an stantaneous mixture of dust and water. This m ture of sludge is then charged at the bottom of unit. Any desired commency of sludge can be tained by controlling i fed into the unit.

ijΖ

plico

ssi

into the wet disposal unit.

Dust which falls from the dust collector hopper through a flexible coupling is deposited directly into the screw conveyor. The rate at which this dust is then fed into the mixing chamber of the wet disposal unit can be controlled through a gear speed reducer and variable speed motor pulley. At the same

"Hisey" Heavy Duty Polisher and Buffer

The illustration shows a heavy polishing and buffing machine which now being offered by The Hisey-W

Gear Specialties

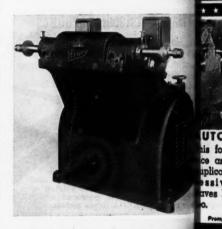
SPURS - HELICALS (14 to 96 D.P.) BEVELS - (straight and spiral)

WORM GEARING — THREAD GRINDING

This range logically embraces the gear components of many critical control devices essential to the war effort and this organization is proud of its contributions of such material in the program.

With full production capacity scheduled far into the future, all new inquiries are now necessarily subordinated to these vitally important prior commitments. However, every urgent need will be given careful consideration.





"Hisey" Heavy Duty Polisher and Bu

Machine Co., Cincinnati, Ohio. The chine is equipped with two spins which are driven through V-belts means of two separate standard type motors located inside the base. machine is also available in a significant spindle single-motor type and cas obtained with motors from 3 to 10 merican Showing on

ust ent r other at the ed min ing an ure of

This n then tom of d cons an be lling t and w

lisher

lisey-W

d Bull

-belts ard ase. a sin CAU

o 10 h







Lempco proudly flies the "E" Award for outstanding performance in war production.

GRINDERS

WITH

AUTOMATIC

SIZER FOR PRODUCTION RUNS



UTO - SIZER is fool-proof dece assures exact uplication of sucssive pieces. rves lots of time,

INTERNAL, EXTERNAL, FACE and TAPER TURNS' AS WELL AS GRINDS!

Unexcelled for tool-room or production work. Rapid set-up, quick-change speeds, and accuracy make it practical for tooling and finishing small dies. Heavy-duty, durable construction enables it to set the pace and hold it on the production line. 30" swing; 7" cross-slide; 16" carriage travel.

t Delivery! Priorities Can Be Had - Write Us.

SEE ONE WORK - MAIL THIS COUPON

UC BEDFORD OHIO ESTABLISHED

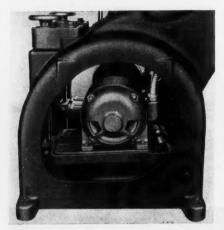
Lempco, Dept. MM, Bedford, Ohio

Gentiemen: Tell me shop nearest me where I may see a LEMPCO Grinder in operation.

Address

wary, Panuary, 1943

MODEL



Side covers removed from base of "Hisey" Heavy Duty Polisher and Buffer showing mounting arrangement of motors

capacity. The motors are mounted on hinged plates which are provided with handwheel adjustment for regulating belt tension. The machine as shown in the illustion is equipped with "open" type as dles of extra large size. The mach however, can also be furnished with cased type spindles having hour around the spindle extensions and bearings directly adjacent to the what Additional features of the "His

Additional features of the "He Heavy Duty Polisher and Buffer incast iron housing, easily removable and constant level type oilers. It spaced required, 70 x 40 inches.

Stanley "Flud-Lite" Magnific

An inspection device which combinagnification and shadow-free flucent lighting, to be known as the sley "Flud-Lite" Magnifier, has a placed on the market by the Sta Electric Tool Division, The Sta Works, 137 Elm St., New Britain, C The device can be used in assembly small parts, locating cracks scratches in work, inspecting ream gages, punches, dies, and so on, magnaturing small instruments, engrand other operations where magnifition is required.

The Stanley Flud-Lite Magnifier

Rockford Industrial Clutches



Will Help Improve That After-War Model

Now is the time to plan the design of a more efficiently and economically operating product. The extensive experience of our field engineers and lactory engineering department are at your disposal to help you specify a power transmission control arrangement that will help improve the performance of your after-war models.

Rockford Drilling Machine Division Borg-Warner 300 Catherine Street, Rockford, Illinois, U. S. A. Corporation



PULLMON Multiple Dis

Yes si

means

above

Sawin

the fi

for he

These

They

straig

cut .

single

terial

parts i

Frame

nuary

Rugged, compant casy to install as adjust. For oil or to operation. Capacin I to 75 h.p. at Mr.p.m. Can be opplied as both chall and brake.

SINGLE TYPE

Pullmore Clutche have the same capaities as the double type clutch.

Machine Tools Process Machinery Farm Implements Materials Handling Earth Movers Service Machinery Power Unit

Pullmore Multiple-Disc Clutches V Over-Center and Spring-Loaded Clutches V Power Take-

the illust type a ed with g hous RYBODY ... ns and the wh ALL TOGETHE ffer inc ovable agnifil comb ee flu tain, 0 ssembl engrav

6 SAWS x 24 HRS. = 144 SAW-HRS. PER DAY!

Yes sir! . . . 144 Peerless saw-hours in any war plant means a lot of production! And, as you see in the above photo, "Women at Work" on Peerless Metal Sawing Machines, is thoroughly practical. Making the first cuts, these women release vital manpower for heavier tasks in war production!

These are safe, fast, accurate, easy-to-operate saws. They conserve metal because the thin, cool-running, straight-cutting blade removes as little as 1/4" in the cut . . . 1500 to 3000 square inches are cut with a single inexpensive blade . . . and waste of vital material by rejection at final inspection of Peerless sawed parts is avoided because the patented Four-Sided Saw-Frame and Backing-Plate Blade-Support provide ex-

clusive automatic features that control feed and bladelift, blade-tension, and accuracy to thousands of an inch, without danger of fractures, surface hardening or off-square cutting. The fine steel chips are washed into the chip tray by constant flow of soluble oil.

Manpower is saved because Peerless Saws need only minimum attention in operation, thus requiring fewer men, or women, to run them. Large work tables permit loading by crane . . . no manual lifting, no out-end holding. You are sure of 3-way advantages . . . speed, safety and savings in metal and blades . . . when you invest in Peerless Power Saws. Send for latest literature . . . use coupon below.

PEERLESS MACHINE COMPANY . Racine, Wis.

ertess IETAL SAWING MACHINES

PEERLESS MACHINE COMPAN	
☐ Mail catalog on Peerless St ☐ Mail catalog on complete Hydraulic, Vertical, and U	e Peerless line -
Company	
Individual	************************
Street	***************************************
CityState	MM 1-43

FAST, ACCURATE CUTTING DEMANDS POSITIVE BLADE CONTROL

ie

lers. les.

the ! he St e

racks real on, m

magn nifler

LLMON ipto Dis

LE CLUTO

d, compact

install ar

For oil or de

on. Capacitie

h.p. at ill

Can be a

both clutd

LE TYPE

e Clutches

same cape

the double

wer Units

Take-0

uary,

ke.

sists essentially of a fluorescent daylight lamp scientifically focused so as to distribute light over object without shadow, and 5-inch diameter high qual-



Stanley No. 701 "Flud-Lite" Magnifier

ity lens with focal length of 13 inches. The lens is firmly mounted in a diecast frame, which has a durable black finish and is provided with rotary light switch for operating fluorescent lamp.

The Stanley Flud-Lite Magnifier is designed for operation on 60 cycle alternating current, 110-120 volts, and is

KEEP PRODUCTION "FLYING"



SIMPLEX-M ABRASIVE BAND GRINDER

This improved band grinder speeds production in war plants, large and small. Built to machine tool specifications, Simplex-M eliminates expensive, slow, hand emerying and filing. Assures straight grain, sharp-edged finish. Variety of sizes and styles.

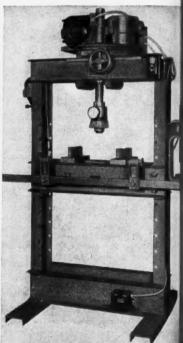
Free Booklet on Finishing! Write Today!

WALLS SALES CORP. 96 Warren St., New York, N. Y.

available in two models designated the No. 701 and No. 701H. The Na magnifier is designed for use in an blying or inspecting work on bent conveyor belts, or machines and equipped with a steel base, two attentions of the contracting faither designs. able, smooth-acting, friction joint in and six feet of cable with ballast The base can be removed for p The base can be removed for panent anchorage of magnifier, which a shipping weight of 8½ lb. The 701H magnifier, which is designed portable inspection anywhere in plant, is equipped with a comforting grip, hardwood handle and six fee cable with ballast plug. This magnifies a shipping weight of 5½ pos

Automatic Pressure Control Lempco "Pressurematic" **Electric Power Press**

An automatic pressure control w can be readily attached to the ran



Lempco "Pressurematic" Electric Power Equipped with Automatic Pressure Con

HOW TO GET TOP PRODUCTION FROM ABRASIVE CUTTING

ignated he No.

wo adjoint at

or per which The

mfor

ix feet

trol

tic"

rol v

e ran

S

If you are doing production cutting of steel, brass, bronze, monel metal, ceramics, plastics, glass—it will be well worth your while to get a copy of this new booklet, "Abrasive Cutting."



HOW TO MAKE CUTTING WHEELS LAST LONGER

That's a problem this book will help you solve with data on wheel life, wheel speed and feed speed.

It compares the advantages of dry cutting and wet cutting, different methods of using coolants—gives tables of time per cut and number of cuts per wheel for diameters from $\frac{1}{2}$ " to 6"—covers the whole subject.

WRITE FOR FREE COPY

You are welcome to a copy of this well-illustrated booklet. No charge. Write on your company's letterhead.

If you have a certain problem, send full data including type and size of material, length of stock before cutting, length of cut-off pieces, production per hour desired, etc.

Campbell 1

ABRASIVE CUTTING MACHINES

ANDREW C. CAMPBELL DIVISION · Bridgeport, Connecticut

AMERICAN CHAIN & CABLE COMPANY, Inc.

the Lempco "Pressurematic" Electric Power Press for use in performing production pressing, assemblying, straightening operations is announced by Lempco Products, Inc., Bedford, Ohio.

The design of the control includes a dial gage with regulator hand which is set to any desired pressure after con-trol is installed on press. When this presset pressure is reached, the electric circuit of the press is broken, thereby cutting off power and stopping ram travel instantly. The control may also be set so as to back ram off work or



W AR plants the country over rely on Castolin Eutectic Alloy \$14° (for gas welding) and Castolin Eutectic Alloy \$24B* (AC-DC metallic arc) for easy, reliable welding and reclaiming of broken, cracked, worn, or defective castings. These new low temperature welding alloys give a completely machinable, color matching weld-free from stresses and distortion.

Use Castolin Eutectic Low Temperature welding alloys #14° and #24B° in place of "hard-to-get" bronze welding rods. Castolin Eutectic Alloys #14° and #24B* contain no scarce metals . . . available with priority A9.

WRITE FOR DATA BOOK 59

*Patented

EUTECTIC WELDING ALLOYS CO. 40 Worth Street, New York, N. Y.



Lempco Automatic Pressure Control

raise ram any required distance and turn again, thus providing an act RPM. eff similar to that of a punch press.

The Lempco Automatic Pressure (trol is available with two types of a gages, one for jobs requiring 7 to tons pressure, which is sensitive with gages, one for jobs requiring 7 to tons pressure, which is sensitive will. Extra 250 lb., and another for jobs requirently localess than 7 tons pressure, which is a pents, n less than 7 tons pressure, which is a sitive within 100 pounds.

"Dustkop" Model 1250 Self-Contained Cyclone-Type **Dust Collector**

Designated as the Model 1250, a clone-filter type self-contained dust lector having a 1,250 c.f.m. capath which is said to be adequate for hausting dust-laden air from large wh buffers, polishers, and grinders or m grouped small wheel equipment been added to the line of "Duskky dust collecting systems marketed by the Aget-Detroit Mfg. Co., 2046 Book Tower Detroit, Michigan.

The unit is available with either on way or two-way intake ports and is connection with flexible metal hose

Ask any apping or year creased ncrease cunier ! inder th ruickly why Pro by the ountry.

ruate. No. 2 to ressure

The feat :lude:

ional hi

BEND F lete line he new I

AFETY

PROCUN 12 S. C Send me Tru-C Machine

Name .. Address

"It Gives Us Better **Tapping in Less Time**"

Ask any production man in a shop where Procunier Capping Machines have been given the acid test or years. Invariably you will get a story of inreased output, more accurate tapping and greatly ncreased tap life. You will be told that the Prounier Tapping Head stands up year after year under the tough grind of production work - and wickly pays for itself in greater production. That's why Procunier Tapping Machines are being used y the most exacting production shops of this ountry.

Definite Reasons for This Superior Performance

and slude: 1. Four speeds, ranging from 390 to 2050 at RPM, efficiently handle jobs for which convenhe features that make better tapping possible inional high speed tapping machines are inadere Countries and in a construction of the is a nents, maintain pre-set tap feeding and reversing pressure INDEPENDENT OF OPERATOR.

SEND FOR CATALOG giving full details, description and prices on the full line of Procunier Universal Tapping Machines, hand or foot operated, the com-lete line of Procunier Precision Tapping Heads to meet all needs and he new Tru-Grip Tap Holder.

PROCUNIER

AFETY CHUCK COMPANY, 12 S. Clinton St., Chicago, Ill.

PROCUNIER	SAFET	Y CI	HUCK	COMPANY	
19 4 011				••	

PROCUNIER SAFETY CHUCK COMPANY

12 S. Clinton St., Chicago, III.
by the Send me bulletins on: | High Speed Tapping Heads |
| Tru-Grip Tap Holders | Universal Tapping





trol

elf-

st d pacil or e

r one



Danly **Commercial Sets** Danly **Special Sets**

THEIR PRECISION

Means Greater Accuracy In Your Production

DANLY MACHINE SPECIALTIES, INC. 2100 S. 52nd Avenue, Chicago, III.

MILWAUKEE • LONG ISLAND CITY, N. Y.
DAYTON • DETROIT • ROCHESTER
CLEVELAND • PHILADELPHIA
Ducommun Metals & Supply Co.
Los Angeles • San Francisco





Write for

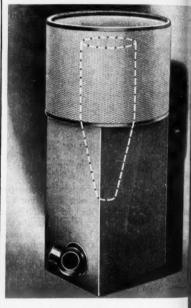
WITH the THERMOID HARDY Flexible discs that aid in eliminating wear and tear on the driving units.

DEALERS IN PRINCI-PAL CITIES CARRY STOCKS FOR IMMEDIcomplete information. ATE SHIPMENT.

FLEXOID COUPLING CO., Div. THE SMITH POWER TRANSMISSION CO. Cleveland, Ohio 1545 E. 23rd Street

pipe. The compact design permits collector to be located immediately mediately to the machine or machines to which is connected, usually without movinthem or requiring any increase in fa space.

The Model 1250 dust collector emple a cyclone (indicated by dotted lines the accompanying illustration) to clect the greater percentage of all a and dirt exhausted. In addition, as ter having a single thickness of m



"Dustkop" Model 1250 Self-Contained Cycle Type Dust Collector

ily renewable spun glass material used so that the air from the cycle receives a further and final cleams Removal of the collected dust and from the cyclone filter is said to quire only a few minutes.

The Dustkop Model 1250 Dust 0 lector employs a multiple-blade direct driven by a continuous duty h.p. motor to draw the dust-laden from the source and send it up to top of the unit where it enters the clone. So effective is the design of cyclone that virtually all the dust dirt is said to be removed from air and deposited in a removable tainer. The air then rises through top of the cyclone and is returned

f Turne t once our org .. keep verhead

INCR CA This is Illies, fi he pres om, ha

Now a argest o apacity gainst o not sat

NOW



INCREASE YOUR PRODUCTION CAPACITY 25% TO 300%

This is no time to waste time... America and her illies, fighting side by side all over the world for he preservation of the United Nations and freem, have a job to do... and fast! Enlist the aid if Turner Uni-Drive units in your plant and you'll tonce find what a real fighting tool you have in our organization to help you speed up production ... keep down power costs...eliminate costly verhead counter shafts.

Now successfully used in many of America's agest defense plants — increasing production apacity as much as 300%. Guaranteed for 1 year gainst defects in workmanship and materials and old subject to return for full credit within 60 days not satisfactory.

See your dealer today or write us for full information.

For Lathes, Milling Machines, Shapers, Turret Lathes, Radial Drills, Boring Mills, Hobbing Machines and various machine tools...also Browne & Sharpe and Cleveland Automatic Screw Machines. Can also be adapted to many special applications.

EASILY INSTALLED WITHIN 2 TO 4 HOURS

The TURNER UNI-DRIVE can be quickly and easily installed within a few hours without completely shutting down your shop.

THE TURNER UNI-DRIVE COMPANY

NOW AT WORK FOR VICTORY***

(SALES DIVISION: TURNER MACHINERY CO.)

3416 TERRACE STREET KANSAS CITY, MISSOURI

PRODUCING MACHINE TOOL DRIVES . ORDNANCE TOOLS . AIRCRAFT FITTINGS

Jary, I anuary, 1943

Cycla

erial i

leanin

and di

to

ist C

de f

the

n of th

lust a

ble o

the working space after it has passed through the drumshaped spun glass filter which encompasses the top of the cyclone, thus receiving a final

cleaning.
The Model 1250 collector can be supplied with motor suitable for any standard 60 cycle alternating current or for direct current operation as required. The unit is 62 inches high overall, with diameter of drumshaped filter 30 inches, and requires a floor space of approximately 20 x 28 inches.



HydroLectric Motorized Hand Lift Truck

HydroLectric Motorized Hand Lift Truck

A motorized hand lift truck designated as the HydroLectric is now being man-ufactured by Lift Trucks, Inc., 2425 Spring Grove Ave., Cincinnati, Ohio. Features of the truck include powerful motor, large battery, automotive gear transmission, rear lead wheel drive to ensure positive traction, balanced handle, four wheel construction for sai and stability, finger-tip control,

re q

lightweight design.

According to the manufacturer, HydroLectric Lift Truck can be of ated by any inexperienced works Maximum loads are easily lifted the a powerful hydraulic ram. Pressure

SMALL DRILLS ARE MIGHTY BIG FACTORS IN PRODUCTION CRITICAL WAR PRODUCTS - KEEP THEM SHARP - WITH



PRECISION DRILL GRINDERS

Motor driven, these highly efficient Black Diam Grinders are doing yeoman service in hundred large and small war production plants through the nation.

They not only produce quantities of perfect sharpened small gauge and fractional drills, lips of uniform length, correct angle and pr clearance for true, accurate drilling-but re skilled mechanics for more important work.

The Web thinner, an important attachment, for the proper grinding of Notched, Colla so-called Crankshaft points . . . and the diam dresser keeps the grinding wheel always sharp

Write for Bulletin 122

BLACK DIAMOND SAW & MACHINE WORKS, IN

UNION

The tools you buy again

Tough jobs, "fussy" jobs, unusual jobs of war production —
Union will take them all on and produce results that meet oday's urgent requirements for speed and accuracy and tool economy. Why? Because every tool in the Union line is made of carefully selected steel, and Union methods of manufacture are guarded by the most exacting standards of tool making practice. Tools for war production must

be chosen with care. Try
Union on the tough jobs
and we're sure
they'll become
the Tools You
Buy Again—
for every job.

UNION TWIST DRILL COMPANY

STORES

New York - - 61 Reade St. San Francisco - 121 Second St. Chicago - - 11 S. Clinton St. Los Angeles - 524 E. Fourth St. Detroit - - 6540 Antoine St. Seattle - 568 First Ave., South

ck

or sat

trol.

urer.

be o

d thro

ON

ERS

perfect drills, and property court reliance to the court reliance

e dia

nuary,

the finger-tip control of the unit enables heavy loads to be moved forward or backward without effort.

Famco Compound Ratchet Type Bench Model Arbor Press

Illustrated herewith is a compound ratchet type bench model arbor press for production, maintenance, and repair work which is now being marketed by the Famco Machine Co., 1324 18th St., Racine, Wis. The press, which is

GEARS
Good Gears Only
All Kinds
Any Quantity

AT THE RIGHT PRICE
THE CINCINNATI GEAR CO.
1825 Reading Road Cincinnati, Ohio

also available in a floor model, can botained in various sizes for handle work from 18 to 27 inches in diameter

Outstanding features of the unit include front and side gib adjustments for maintaining perfect alignment of ram at all times. The serrated ram and mating pinion are cut from specially selected steel and are provided with heavy stub teeth to reduce possibility of breakage to a minimum. The square design of the ram is said to enable it to exert uniform pressure without springing. The frame of the press is constructed of semi-steel.



Famco Compen Ratchet Type Ben Model Arbor Pres

Mark It Quickly with a NUMBERALL



chine. One wheel can be turned quickly by knurled knob for consecutive numbering.

NUMBERALL STAMP & TOOL CO.

Huguenot Park, Staten Island, N. Y.

Rousselle "Victory" Adjustable Spacer

Known as the Rousselle "Victor, an adjustable spacer designed to redu straddle-milling operation set-up time



Rousselle "Victory" Adjustable Space

a minimum is announced by the Dat J. Ross Co., Benton Harbor, Mich. use, the spacer is simply slipped the milling machine arbor together of conventional type spacers and is



ry, H January, 1943

screwed to a setting accurate to 0.001 inch and locked in position by inner

locking ring. Adjustment for length is approximately ½ inch.

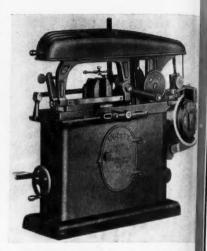
The Rousselle Victory Adjustable Spacer is made of alloy steel, hardened and ground, and is accurately threaded and finished. The spacer is available in five standard arbor diameters of 1, 14, 11/4, 11/4, and 2 inches, thus enabling it to be adapted to all standard milling machines.

Keller No. 3 Hy-Duty Power Hack Saw

Designated as the Keller No. 3 Hy-Duty, an improved hack sawing machine having a cabinet base and built-in coolant tank together with pump has been introduced by the Sales Service & Mfg. Co., 473 N. Cleveland Ave., St. Paul, Minn. The machine is equipped with a swiveling base vise and has a capacity for sawing 6¾ x 6¾-inch work straight and 4-inch work at a 45-deg. angle. The unit is designed for use with blades from 12 to 14 inches long and can be operated at speeds from 100 to 168



years of oil cup experience



Keller No. 3 Hy-Duty Power Hack Saw

angl

F & work sists

by b plete

1033

For

strokes per minute, the speeds beindivided into two ranges which are tained by shifting belts.

The Keller No. 3 Hy-Duty Pow Hack Saw is powered by a ½ h.p. a motor, single or three phase, and equipped with an automatic stop switt for stopping the motor when a cut completed. Feed pressure to the bla is regulated through a handwheel i cated on the front of the base. Press is applied to the blade only when the blade is cutting. To prolong its li the blade is automatically raised on the reverse stroke. The machine also is cludes foot lift to saw frame. The Keller No. 3 Hy-Duty Power Ha

Saw measures 22½ inches from floor top of vise, is 40 inches long oven and occupies a floor space of 13; inches. Weight complete with mot 542 lb.; shipping weight, 596 pounds.

T. H. LEWTHWAITE MACHINE CO

PUNCHES CUTTERS BENDERS SPECIAL TOOLS

PUNCHES and DIES for round, square and other shaped holes.

NEW YORK OF 317 EAST 47TH ST. Plaza 8-0380



January,

CUT SET-UP TIME IN HALF with F & H UNIVERSAL VISE!



Saw

s bein

Pow

n.p. a.

and in switten cut in the blad heel in

ressu hen ti

its life l on the

er Had

floor i

13 x

nds.

RK CIT

Jary,

Just Dial The Angle!

Handles complex drilling, grinding, ligat, milling, other machining operations as easily and quickly as simple angle. Compound angles produced literally by twist of dial, reducing

set-up time from hours to minutes. Available with grinding wheel angle attachment.

For Clamping Odd-Shaped Pieces

F & H Equi-Hold for instant clamping of work pieces with unparallel planes. Consists of two friction plates jointed together by ball and spring socket. Write for complete information to . . .

F & H MANUFACTURING CO. 10338 GRATIOT • DETROIT, MICH.

WHITNEY - JENSEN

G742 Blind Rivet Puller

The G-742 Blind Rivet Puller is 1 new tool developed to apply blind rivets. Capacity 36" rivet, ball bearing, interchangeable chucks for flush or brazier blind rivets.



WHITNEY METAL TOOL COMPANY
110 FORBES ST. . ROCKFORD, ILL.

AUTOMATIC STAKING MACHINE

For Work that Cannot Be Done on Conventional Riveters

Ideal for riveting movable joints, as blow of trip hammer is always uniform and can be adjusted to hit proper blow for job at hand. Work is held firmly by pressure pad while being struck by hammer.

The most efficient device available for pointing with platinum, tungsten, or silver. Fast and accurate.

1 1-B 2 Stroke 2" 2" 2½"

Spindlel" 1" 1¼"
Throat

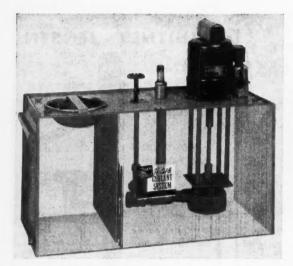
Depth 4%" 4%" 81/2"

Weber Machine Corporation



January, 1943

MODERN MACHINE SHOP 301



Gray-Mills Model G-10A Portable Coolant System

Designated as the Model G-10A, a portable coolant system consisting of a centrifugal pump designed to deliver a controlled coolant flow from 10 to 1,000 gallens per hour, and a 40-gallon coolant tank has been announced by the Gray-Mills Co., 231 W. Ontario St., Chicago, Ill. The system is said to be particularly applicable to large type drill presses, cut-off machines, grinders, milling machines, and turret lathes and as a stand-by unit for central systems.

The pump consists of a high stress casting with sleeve bearings. Intake orifice is 1½ inches; discharge, 1 inch. Both one and three phase ½ h.p. motors, 110/220 or 220/440 volts respectively, are available for use with the pump.

Gray-Mills Model G-10A Portei Coolant System

The coolant tank is 1 inches deep x 16 inches wix 36 inches long and has corrosion - resistant finish. The design of the tank is cludes a double baffle play which provides forced as tling, and a readily access ble flow control valve. In cover of the tank is provide with a filter screen white can be easily removed in cleaning.

Carboloy "Standard Design" Tools and Parts

This

and

GE

1806

In order to eliminate vast amount of special to designing on the part

designing on the part carbide tool users, as well as to spe production of many special tools a parts, the Carboloy Co., Inc., 11143 8 Mile Ave., Detroit, Mich., has est lished a series of design standards is several special type tools and parts, is cluding cut-off tools, roller turner too grooving tools, shear-type tools, twidrill tips, plug gage and ring gage butings, drill jig bushings, guide ring twist drill stock, round, oval, har round, and rectangular rod, and tubis

Carboloy "Standard Design" Cutoff Tools are available in five sizes ranging from % x 1½ to 1 x 2 inches. Tips these tools are on the right side of the shank when viewed from the top of the shank being chamfered at an aut of 45 deg. Blank widths range from inch on the smaller to ½ inch on the

" • 92" CUTTING TOOLS

• 92 TOOL BITS are indispensable in every shop doing war speed work. Made by the noted Leichner process, these bits cut, with absolute accuracy; at higher speeds; (300 ft. per min.) stand shock and intermittant cuts. • Will outlast carbide tools 5 to 10 times. Cut any type steel, malleable, cast iron, brass, copper, aluminum and alloys. Easily ground. • 92 TOOL BITS, ¼", ½", ½", ½"; Rt., Lft., Ctr...................................\$4.00 ea.

Set of any 3 above sizes - \$10.80.

Write for prices on larger or special sizes.

+92 TOOLS ARE GUARANTEED TO DO A BETTER JOB OR YOUR MONEY REFUNDED.
DIAMOND TOOL PRODUCTS, 2310 Cottage Grove, Chicago, III.



NEAT STAMPING in NAME PLATES

Portel

hes wi

d has

tank i

access ve. The provident which

ved f

ndard ols

inate

cial to

part

o spe

11143

erts, is er took s, twi

ring l, hall tubing Cut-0

rangin

Tips of the

part on angi

from

on t

DED.

111.

finisi

Nameplate Detail Press

This machine quickly stamps details and serial numbers into name plates.

Write for Particulars

GEO. T. SCHMIDT, Inc.



FOR THE DURATION!

- MORE SPEED
- LOWER COSTS

FAMCO Presses step up production and assembly operations requiring percussion and pressure. 40 S T O C K SIZES AND MODELS scientifically engineered for greater capacity, size for size, and trouble-free operation.

Write for details.

FAMCO MACHINE CO



famco PRESSES

HAMILTON SWISS TYPE GEAR HOBBERS



...for accuracy and speed in hobbing of

pinions; wheels, gear sectors and similar component parts of Aviation Instruments, Time Fuzes, Meters, Clocks, Watches, and other precise mechanisms.

> No. 00 SPUR GEAR HOBBER for work up to 2" diameter.

No. 1 SPUR and SPIRAL GEAR HOBBER for work up to 6" diameter.

*

If your production requires the cutting of highly accurate fine pitch gears and pinions, write TRIPLEX for complete detailed specifications.

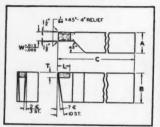
Manufactured by
THE HAMILTON TOOL CO.
HAMILTON, OHIO



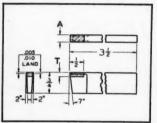
Exclusively Sold by
TRIPLEX MACHINE TOOL CORP.
125 BARCLAY ST., NEW YORK, N. Y.

303

CUT-OFF TOOLS



GROOVING TOOLS



Carboloy "Steme Design" Tools and Parts

Carboloy Stand

DEAR

MILLS

Work he and clo ejected. ing 1, 2 Minimum

duction.

70 S. C

Fed

speed at less

Vibrat every

Twin [

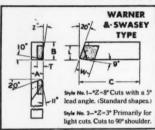
bide to with to

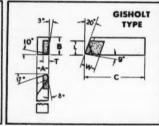
ard Design Rolle Turner Tools a designed with u usually large tips for maxim life and are aval able in five size for Warner & Swa sey lathes and to sizes for Gishol lathes. The forme sizes range from x 1/2 to 1 x 11/4 inc and are design for use in W & roller turners Not M-1370 to M-17 inclusive. To styles of such too are available, or cutting with a deg. lead angle which is the stand ard shape, whi Style No. 2 is de signed for light cuts up to a 90-deg

shoulder. The two sizes roller turner tool for Gisholt laths are designed to a roller turners. Th cludes a 1-inc square shank while the other has

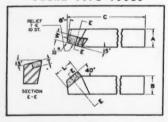
one size of tool is

CARBOLOY TOOLS FOR ROLLER TURNERS

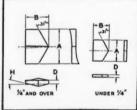




SHEAR TYPE TOOLS



TWIST DRILL TIPS



larger cut-off tools. The tools have a back taper of $1\frac{1}{2}$ deg. on each side to assure free cutting.

14-inch square shank. Three classes of Carboloy Standar Design Grooving Tools are available

Produce with S

It pays to protect your operators by equipping your presses with

STRAND SAFGUARDS

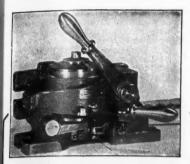
Easily installed. Adjustable to the most intricate die. Can be instantly changed for any set-up.

Write for Bulletin today.

STRAND MFG. CO., INC. 156 N. Desplaines St. Chicago, Ill.



anuary, 194



ole

stand-Roller

B 87

h up

arge

imi avail Size Swa-

d two

orme om § inch

lignei & S Not

A-137 Two

angle

DEARBORN Automatic Chucking and Indexing Fixture MILLS OVER 1000 PARTS PER HOUR

Work held by draw in collets. Collets open work need by draw in collets. Collets Open and close automatically. Work automatically ejected. Indexes without loss of time for milling 1, 2, 3, 4, 6, 8, 12 or 24 sided pieces. Minimum set-up time required. Speeds up production. Positive and accurate in operation.

J. W. DEARBORN

70 S. CLIFF ST. ANSONIA, CONN.

GRAHAM MULTI-PURPOSE VISE



With jig attachments and various special jaws we furnish, these vises will hold an amazing variety of work, climinating the need for custom-made jigs and fixtures. For drill press, miller, radial, shaper, planer, grinder.

KNURL HOLDER FITTING LATHE TURRET

This versatile tool makes endless variations of patterns, straight, spiral and checkered from the same pair of straight cut knurls. Capacity: up to 21/4 dia. of work.

Request Illustrated Price Circulars

GRAHAM MFG. CO.

35 BRIDGE ST.

EAST GREENWICH, R. I.



the classes differing only as to tolerances on tool width. Class "A" grooving tools are held to a total tolerance of 0.002 inch, while Class "B" and "C" tools are held to tolerances of 0.001 and 0.0004 inch respectively. The three classes of tools cover a size range of from 0.060 to 0.330 inch.

Carboloy Standard Design Shear-Type

Carboloy Standard Design Shear-Type Tools are available in both left and right-hand types, with shank dimensions ranging from 1 inch square to 1½ x 2 inches. The tools can be obtained in both cast iron and steel-cutting grades. The tips of these tools are mounted at a 40-deg. negative rake angle in the tool shank, this large angle resulting in a shearing or slicing type of cut, thereby reducing impact to a minimum.

Standard design tips for twist drills are available in some 30 different sizes ranging from 1/4 to 11/5 inches in diameter.

Vogel-Peterson Locker Rack

The Vogel-Peterson Co., 1801 N. Wolcott Ave., Chicago, Ill., announces the addition of a locker rack to its line of wood wardrobe equipment. Designed to conserve floor space, the rack, which is

PLOSTEP UP DIE MAKING MACHINES

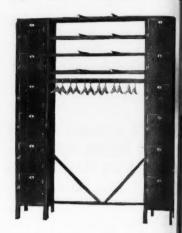
"THE TOOLMAKER'S BEST FRIEND"

Unmatchable performance for most difficult sawing and filing of tools and dies. Compact, powerfully built, for rigorous shop service. Faster, more economical in operation.

Write or wire for details and prices.



built of hardboard and plywood, is feet long and is arranged to accome date belongings of 12 employees. The unit provides each employee with a



Vogel-Peterson Locker Rack

hanger sufficiently spaced from of hangers to permit wet wraps to quid dry, individual hat shelf space, and 12 x 12-inch lock box for micrometa drawing instruments, lunch-boxes, a other personal belongings.

"Ordnance Greaseproof" Pape

Known as "Ordnance Greaseptor Paper, a packaging material design to meet Government specifications wrapping of all metal parts furnish by either prime or sub-contractors been developed by the Packaging D. E. W. Twitchell, Inc., Public Leis Bldg., Philadelphia, Pa. According the manufacturer, the paper has grease resistance of not less than minimum average of 600 seconds particularly by turpentine and has a range of 6.5 to 7.5.

Common base weights are 25 and lb., however, Ordnance Greasen Paper can be obtained in any deribase weight and either plain or was The paper is also readily available 25 lb. weight laminated to 30 lb. not trait Kraft grades for uses what greater strengths are required or was y surfaces may not be desired to the laminated combinations can supplied to order to meet special metallic paper and the companion of the supplied to order to meet special metallic paper and the companion of the companion o

Bomb
The No

of Amn

USE F

constru Sizes 4 gauge.

DRE

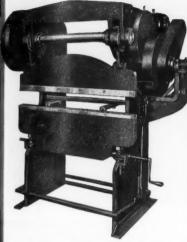
CHICAG

CHICAGO STEEL PRESS

od, i

es. 7

No. 253



SPEED WAR PRODUCTION OF SHEET METAL WORK

USE FOR ...

m oth quick and 12

omete

Pape

sepro

design

ions i

tors

ng D

rding

than

ds p

8 8

and

a.sepn desit

lable lb. 1

or w

esira

al ne

CSI

ces,

- 1. FORMING
 - 2. EMBOSSING
 - 3. MULTIPLE PIERCING
 - 4. NOTCHING
 - 5. BLANKING

of Ammunition Cases, Bomb Box Liners, Bomb Fins, Aircraft Parts and Many Other Offense Products.

The No. 253 CHICAGO STEEL PRESS is accurate, compact, and ruggedly constructed of highest quality materials. Sizes 4, 5 and 6 ft. capacities up to 10 gauge.

Write for Circular No. 255

DREIS & KRUMP MFG. Company

7418 LOOMIS BLVD.

CHICAGO

ILLINOIS

IF YOUR WORK REQUIRES THE FINEST IN ACCURACY AND WORKMANSHIP,

SPECIFY --



FULLING CONGRAPOR SOLVER SINCE 1919

PUNCH SMALL PARTS FASTER

DURO, aircraft type, punch presses are constructed to precision punch aluminum, dural, and other sheet metal and plastics Write today for illustrated catalog on Duro Punch Presses, Bench Milling Machines, and Accessories.



307

M. S. A. Comfo Dust Respirator with Plastic Filter Containers

In order to conserve metal for war production, the Mine Safety Appliances Co., Braddock, Thomas and Meade Sts., Pittsburgh, Pa., announces that its M. S. A. Comfo Dust Respirator is now available with filter containers of black plastic. These containers are thinner than the previous metal ones and have rounded edges, thus providing even better sidewise and downward vision. In addition, the containers are said to have high impact strength, no electrical con-

BORING BAR SET

4 BARS IN CASE

4, 5/16, 4, 4s"

Price\$6.50

BALL POINT
WIGGLER\$1.35

Write for circular.

FLYNN MANUFACTURING CO.

437 BATES

DETROIT, MICH.

Why Use A Shaper to cut Keyways when a DAVIS KEYSEATER will do the job so much quicker and better?

DAVIS KEYSEATER CO.

Exchange and Glasgow Sts. ROCHESTER, N. Y.

ductivity, and to be unaffected by perspiration.

Retaining every Comfo feature d safety and comfort in dust protection

Lone

Tran

ets

Sca

Qui

No S

Wri

63

The

elim

enin

wea

Cap

up to

dian

Cap

up to

up to

to 16

W

an

W

Gr



M. S. A. Comfo Dust Respirator with Plastic Filter Containers

the redesigned respirator has twin size placed replaceable filters of unusual large area. The unit is said to be a tremely easy to clean and maintain as is available in types to meet various dust and mist conditions.

"Condurock" Conductive Flooring Material

Known as "Condurock," a read mixed mastic flooring material whican be easily applied over present floor providing a surface which is said prevent explosions due to static eletricity, has been placed on the many by the Rock-Tred Corp., Dept. BB, W. Washington St., Chicago, Ill. According to the manufacturer, the materials shows a resistance as low as 700 cm to a flow of current applied to a feet through a 5-lb. electrode in contact with 5 square inches of the floor.

In addition to its conductivity, Conductivit

8 MODERN MACHINE SHOP

Attention

by per-

ture o

with

rin side nusually be es ain an variou

oorin

ready

which t floor

said t

ic elec marks

BB, 6 Accom

0 oh

a flo

Cond

and t

has

said

nd a

ry, 194

BRIDGEPORT MILLING MACHINE USERS
Now You Can Convert Your Machine
to a Jig Borer for only \$175.00

Longitudinal and Transverse Brackets Complete with Scales and Verniers.

Easy to Apply.
Quickly Removable.
No Special Machining
Necessary.

Write for Details.



NOTE: Preference Rating Certificate Must Accompany Order.

NICHOL MACHINERY COMPANY

637 No. 7th St.

Milwaukee, Wis.

MORE and SMOOTHER CUTS PER DISC!

The "ABRASAW" Wet Cut-Off Machine eliminates burning and surface hardening — minimizes burring and disc wear.

Capacity: No. 47-W Abrasaw—Solids up to 1" tubing and light sections up to 2" diameter. Size of Discs: Up to 12" diameter. 1/16" to 1/8" thick.

Capacity: No. 48-W Abrasaw—Solids up to 2½"—tubing and light sections up to 3½" diameter. Size of Discs: Up to 16" diameter, 1/16" to 1/8" thick.

WE ALSO MAKE Resinoid, Vitrified and Silicate Bonded Grinding Wheels, Floor Grinders, Face Grinders, Knife Grinders, Tool Grinders.



BRIDGEPORT

Safety Emery Wheel Co., Inc.

be swept, mopped, or scrubbed. Its application requires no special labor and the material is said to set quickly. Condurock is also recommended for use on table tops, workbench surfaces, aisles, walks, loading platforms, stair treads, ramps, and similar traffic areas.

Tempilaq°

The Tempil Corp., 132 W. 22nd St., New York, N. Y., announces that its Tempil temperature signaling compound is now available in a convenient liquid

INSPECTOR'S STAMPS ło Faster Identification of Inspectors or Operators. Different borders may be used for different shifts. Available in 4 sizes. Write for prices today. NEW METHOD STEEL STAMPS, Inc. 145 JOS. CAMPAU DETROIT, U.S.A. form known as Tempilaqo. The m rial, which is available with a range of predetermined melting post between 125 and 1,600 deg. F., can used in welding, heat treating, fabric ing, or any other operation involvi

plication of heat. It is said to work equally well on metal, glass, wood, ceramics, or plas-tics and is espepecially recommended for use on polished surfaces. the inside of tubes or castings, and other inaccessible places, including overhead surfaces.

In use, a thin smear of Tempi-



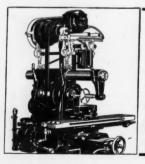
Tempilago

lage is applied to the working sur-face where it dries in an instant. We the temperature stated on the Tempil bottle is reached, the smear liqu sharply. On cooling, it solidifies, leave a glossy or vitreous mark distinctive different from the original smear.

Tempilaq° is supplied in 1½-oz, h pesic tles complete with brush-applicat Properly used, each bottle is said yield up to 300 temperature determin tions or more.

Watson-Stillman High Pressure Starting Pump

A motor-driven high pressure starting pump designed for the primary or all iliary starting of marine and stations Diesel engines, also for the testing oil and water and operation of hydro



They fill the bill...and cut it, too!

Remco is not the only motor drive designed to make changing speeds a quiet, shockless operation, but the others are expensive. For full information send for free copy of bulletin. Write—Remco Products Corp., State and Hay Streets, York, Pa.

REMCO MOTOR

for LATHES, SHAPERS, DRILLS, MILLING MACHINES, etc.

SH

AS

RED GIANT

The m

th a w ting poi F., can involvi

HI AO

llago

nt. W

Fempile liqui

s, leav stinctiv

pplicate s said etermi

essure

startin

or au

ations

esting

hydra

00!

make t the

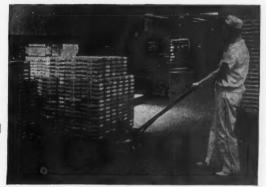
d for orp.,

38

1ry, 19

ear. 6-0z. b

PEED WAR PRODUCTION May Be Operated by Women



Speed up the handling of your raw materials and finished products by installing RED GIANT LIFTRUCKS and REVOLVATOR ELEVATORS for your heavy lifting, piling, tiering and stacking. There's a size and type of each to meet your specific needs. Save time; save space; save labor; save money.

Send TODAY for Bulletin MM.

REVOLVATOR

STEEL BOXES

Shipment!

Immediate

No. 201-

No. 202-

2024 86th St.

North Bergen, N. J.

ESIGNERS AND MANUFACTURERS OF MATERIAL HANDLING EQUIPMENT SINCE 1904



A Straight Side Shop Box with drop handle each end. Excellent for general use where stacking feature is not required.



No. 301-6" x 9" x 31/2"-20 ga....55c Ea. No. 302-8" x 12" x 4"-20 ga. . . . 60c Ea.

6" x 9" x 31/2"-20 ga. . . . 40c Ea.

8" x 12" x 4"-20 ga.....45c Ea.

F. O. B. Factory, Philadelphia

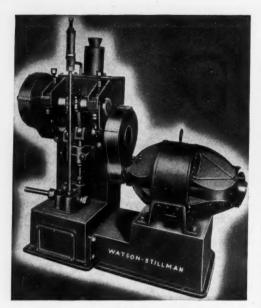


STACKING BOX

An ideal all purpose shop box. Sturdy all welded construction. Skids act as positive stacking lock and re-inforce box at point of maximum wear.

AMERICAN METAL WORKS, INC. 1501 GERMANTOWN AVE., PHILADELPHIA, PA.

January, 1943



Watson-Stillman High Pressure Starting

lic presses, is announced by the Watson-Stillman Co., Roselle, N. Y. The pump is a two-plunger vertical unit, the two 4-inch diameter plungers having a stroke of 1½ inches. The pump, which is powered by a 2 h.p. motor, is designed to develop a pressure of 4,000 lb. per square inch, and delivers a flow of 130 cubic inches per minute at a pump speed of 100 r.p.m.

The Watson-Stillman High Pressure Starting Pump is 48 x 23 x 48½ inches high and weighs 1,400 lb. The tank capacity of the unit is 20 gallons.

Acme Quality Industrial Finish Lay-out Dye

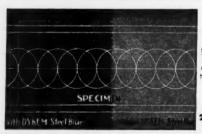
To meet the need for a quid drying colored coating which a be applied to flat sheet metal facilitate the scribing of dim sions, reference points, and on working instructions on suc working instructions on sum metal, the Acme White Lead Color Works, Dept. FS-30, 8250; Aubin Ave., Detroit, Mich., placed on the market a layout n terial to be known as Acme Quity Industrial Finish Lay-out b The material is semi-transpare and purple in color and is avaable in quart or gallon contains

To use, Acme Quality Industry Finish Lay-out Dye is brushed to the sheet metal and is said dry in about a minute. After! material has dried, the desir layout can be scribed on the me with a sharp-pointed stylus, n or other similar tool. The scrib layout is said to stand out cle since bright metal shows throu the dye where scratches have be made.

When the desired cutting, : chining, and so on, has been on pleted on the sheet metal, remaining layout dye may be quick and easily washed off with a rag soals in denatured alcohol. However, in ma cases, the remaining film of layout of need not be removed, since it is said

Boyar-Schultz Model B Screw Machine Tool

Designed to take heavy cuts with so tained accuracy, the Boyar - Schul Model B Screw Machine Tool illustrate



DYKEM STEEL BLUE

Stops Losses in Making Dies and Templates

Simply brush on, right at the bench; ready for the layer n a few minutes. The dark blue background makes the scribed lines show up in sharp relief, and at the same time prevents metal glare. Increases efficiency and accuracy

Write for full information.

THE DYKEM COMPANY ST. LOUIS, MO.

2301 F. NORTH 11th ST.

be so thin.

(In Canada: 444 Pacific Ave., Toronto, Ont.)

HA IMI

x 1 Rol

car

The

Januar

SAVE TOOL BITS

Equip your engine lathes with these economical Lathe Turrets to (1) save tool bits. (2) increase production, and

(3) lower costs.

dustrial

Dye

r a qui Which o

t metal

of dim

and oth e Lead

30, 8250

fich..

avout

cme Qu

anspan is av

ontain

Industr ushed

is said After t

e desir the me lus, n

e scrib out cla

thro ave b

ing, r

een co etal, quick g soak

yout ¢ s said

crew

vith su - Schul

ustrati

es

layout

kes the

curacy.

5, MO.

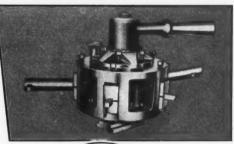
ry, 19

Index plate has 10 stops for 10 different tool settings. Bottom half of tool block oscillates in turret body and allows for minute adjustment of tool. Two set screws rigidly hold boring bar or tool bit. Tool blocks are interchangeable in 5 positions.

Write for folder-today

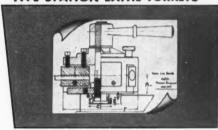
AUTOMATIC MACHINE & TOOL CO.

132 CHARLES STREET AUBURNDALE,





FIVE STATION LATHE TURRETS



The Rugged ROBERTSON for Rapid Cutting

THE ROBERTSON ECONOMY POWER HACK SAWS OFFER MANY FEATURES IMPORTANT FOR PRODUCTION . . .

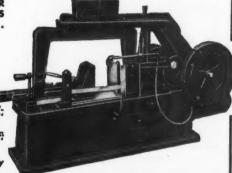
- * Rugged Simplicity
 * Long Life
 * High Speed
 * Hairline Accuracy
 * Few Adjustments

 - * Large Bearings * Long Blade Life * Hydraulic Lift on Back Stroke

The machine illustrated is the ROBERT-SON ECONOMY No. 7X. Capacity 13" x 13". Blades 17" - 21". Robertson ECONOMY Saws are made in sizes from 6" x 6" capacity to 13" x 16"

capacity.

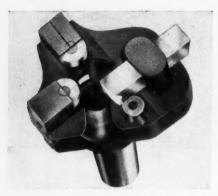
There is a ROBERTSON ECONOMY for every cutting job. Write for information and delivery dates.



ROBERTSON MACHINE & FOUNDRY CO., INC.

RANO ST.

BUFFALO, N. Y.



Boyar-Schultz Model B Screw Machine Tool

herewith, product of the Boyar-Schultz Corp., 2120-K Walnut St., Chicago, Ill., is equipped with a swiveling tool bit and separately adjusted rollers which are said to permit precision adjustments to be very easily made. The tool is rigidly constructed and is provided with ample clearance for chips and coolant, thus enabling parts to be finished to close tolerances.



Standardized Die Sets, embodying many exclusive features, a listing of more than 195,000 stock sizes and 46 different styles afford a service that is unsurpassed.

Send for Our New Catalog

E. A. BAUMBACH MFG. CO.

1806 S. Kilbourne Ave.

314

Chicago, III.

Konag Water Soluble Castor() Jelly

A water soluble castor oil jelly we can be diluted with water to for colorless coolant for use in perform high speed operations on soft me for use in automatic screw mass work, and so on, has been added to line of Konag products marketed by National Graphite Co., Inc., 17 John New York, N. Y. Available in 5-5-gallon steel drums, the jelly is duced by an exclusive process which said to completely remove all gum for ing matter and other deleterious stances existing in raw castor oil retain all the oiliness of castor oil desirable in performing efficient cut operations.

Save new co pries wi

prices. ite for invalua

. Acc

e Pro

990 BRIE

301 DET

Usual ratios of dilution vary from part Konag Jelly to 20 or more puwater, depending upon the preference the operator. A Konag Jelly solution said to be noncorrosive, sudsless, afree from scum formation and sedim and to produce no smell or smoke,

Acme Special Welding Transform

The Acme Electric & Mfg. Co., Co. N. Y., has developed a special well transformer designed for operation



Acme Special Welding Transformer

primary circuits of 115 volts, sint phase, 60 cycles and having seconds characteristics of 0.75 volt, 1,600 peres. This transformer is said to particularly adapted to the products of war materiel.

Castor (

jelly wi to form perform oft men w mach dded to eted by

eted by 17 John 18 in 5 s elly is pus which gum for erious s

or oil, stor oil ent cutt

eference solution sless, a sedim oke.

o., Call welding



Die Makers ACCESSORIES

(sep your tool crib stocked —
Saves time and worry.
r new catalog No. 9 lists all actories with complete specifications

prices.
ite for your copy today—it will
invaluable in the tool and die
m. Accessories in stock at

e Producto Machine Co.

990 Housatonic Ave. BRIDGEPORT, CONN. 3017 Medbury Ave. DETROIT, MICHIGAN

Manufacturers and
Distributors of
Producto
Die Sets, Vises,
Dickerman
Automatic
Press
Feeds.









Oval Wire Springs





Dowel Pins

Socket Set Screws



Square Wire Springs





Steel Punch Shanks



Manufactured to Customer's Blue Phints



For precision metal cutting tools made to your prints A. C. E. offers you a highly specialized experience that assures exact reproduction of your design and a rigid inspection which reduces rejects to a minimum. NOTE: We make no cutting tools for stock.

We have a special department for grinding reamers from the solid. In efficiency and life, reamers ground from the solid are far superior to the conventional type of milled reamers. A fair comparison would be that of a cut thread tap to a ground thread tap.

Write for new illustrated bulletin

AMERICAN CUTTER AND ENGINEERING CORP. 31743 Mound Read, Warren, Michigan

AMERICAN, CULTER

SPECIALIZING IN HIGH SPEED SOTHING TOOLS TO YOUR PENTS



We are proud to announce that out of their own pockets, the employees of Universal have bought and paid for a \$50,000.00 U.S. fighter plane. And this, mind you, they have done in addition to pledging 20% for War Bonds.

We are proud too, of our Universal **Drill Bushings** which are straight and round, and have superfinished bores for accuracy and long life. Write today.



ENGINEERING COMPANY FRANKENMUTH, MICH.

Industrial Cushioned Cutter Pile

Especially designed for use in bos deep holes up to 10 inches in diam with carbide-tipped tools, the Industrial Cushioned Cutter Pilot illustrated by with is now being marketed by the dustrial Engineering Co., Inc., 141
Jackson Blvd., Chicago, Ill. The pi
which can be used with any type which can be used with any type boring machine, vertical, horizontal, angular, engine lathes, turret lath single or multiple drills, and spet machines, is said to be particular adaptable to boring gun tubes and later die pe

CERRO

or en CERRO thin-we Also u nd of CERRO

cast ca for mai

Lieri

O WA

Many

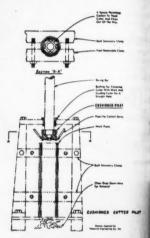
prom

Behin

of a le

of the

Provid



Industrial Cushioned Cutter Pilot

ing gear struts, as well as recoil of ders, propeller shafts, hollow spin hydraulic cylinders, and so on.

The design of the pilot permits a ing bar almost as large as the bon be used, thus providing a rigid # eliminating chatter, and minimi breakage of carbide-tipped tools. addition, the pilot is said to pre-off-center cutting since the tool exis deep into cut away from the main port, and is designed so as to pro passage for applying coolant to bits and washing chips away work. The pilot is also said to be useful in performing finish boring erations.

In use, the Industrial Cushioned ter Pilot is mounted directly behind cutter on a reduced diameter of boring bar where the device does revolve but acts as a bearing for bar as well as a pilot. Heat-twa and ground steel pads, backet

neary,

ter Pil

in bon

diame Indust

ated he

y the

., 141

The pi

y type

Zontal et lath d sper

rticul

and la

Pilot

coil c spin

its al

e bore

inimi

ools.

pren

main s o pro

ay fro be oring oned ehin

r of does

for at-tree cked

nuary,

TIME and CUT COSTS!

CERROMATRIX (Melting Temp. 250° F.) For securing punch and die parts, anchoring machine parts without expensive drive fits, for engraving machine models, short run forming dies and other netal-working applications.

CERROBEND (Melting Temp. 158° F.) Used as a filler in bending thin-walled tubing to small radii. Easily removed in boiling water. Also used for aircraft assembly jigs, templates for forming dies end other purposes.

CERROSAFE (Melting Temp. 190° F.) Used to accurately proofcast cavities such as molds, gun chambers, forging dies, etc. and for many similar applications.

Cerro De Pasco Copper Corporation

O WALL STREET NEW YORK CITY

Representatives and Distributors:

Brooklyn, N. Y., Belmont Smelting and Refining Smelting and Refining Works: Ansonia, Conn., Associates; Bot-Jackson ton, Mass., Jackson Associates: Cleveland, Die Supply Co.; Detroit, Mich., Castaloy Corpora-tion, Chicago, Ill., Ster-ling Products Co., Inc.; Moline, Ill., Sterling Products Co., Inc., Minneapolis, Minn., Northern Ma-chinery & Supply Co.; Milwaukee, Wis., Harry C. Kettleson, Inc.; St. Louis, Mo., Metal Goods Corporation; Kansas City, Mo., Metal Goods Corperation, New Orleans, La., Metal Goods Corporation; Dallas, Tex., Metal Goods Corporation; Houston, Tex., Metal Goods Corporations Los Angeles, Calif., Castaloy Corporation; Mantreal, Can., Dominion Merchants Ltd.; London, Eng., Mining & Chemical Products, Ltd.

Prompt Deliveries of CCURA Sheet Meta

RADIO CHASSIS AND

made exactly to specifications

Many manufacturers of radios under Government contracts have found Stackbin a prompt, dependable source for sheet metal parts.

Stackbin offers you unusual facilities to fabricate

these and other sheet metal products

Behind these special products stand the designing experience and production facilities of a leading maker of parts and materials handling equipment. You can take advantage of their knowledge of sheet metal fabrication. Write Stackbin Corp., 53 Troy St., Providence, R. I., to find out what they can do for you.

"Stacked and

Still Accessible"

STACKBIN CORP., Providence, R. I.

nuary, 1943

MODERN MACHINE SHOP 317 springs as required, are constantly under pressure against the bore. Pads are of a proper length to provide long life to the pilot, which is built special for each job in sizes from 3½ to 10 inches in diameter and is said to work equally well with single and multi-blade boring tools.

"Xactor" Protractor

Designated as the "Xactor," an improved protractor for use by engineers, tool grinders, and machinists has been placed on the market by Industrial Engineering. Co., Inc., 141 W. Jackson Blvd., Chicago, Ill. The protractor is designed to measure directly any surface angle, large or small, such as ground on tool bits, without the aid of any attachment. The unit can also be used to quickly measure the taper on shallow blind holes or tooth angles on broaches simply by sliding the arm to suit conditions.

The degree graduations on the Xactor Protractor are so arranged that the component angle as well as the required angle can be read directly. The sliding arm of the unit is graduated so that the exact depth of holes is quickly

measured. Marks and figures are all y etched, thus enabling them is seen even where lighting is not of best type.

Aside from its fine accuracy, the



"Xactor" Protractor

Even

Sterli longe of too ened

They twisti

And to inj

Flexi

Supe

П

261

anvar

tor Protractor is very light in we thin, and has no projecting set at or other clamping devices or at ments, thereby permitting it to be a ly carried in a pocket. The protra is supplied in neat leather case, pai in box.

WRITE FOR CATALOG

Willey's Metal

Tungsten Carbide blanks as I lustrated are manufactured erclusively under WILLEY'S Parents in grades suitable for dyour machining requirements. Whether you are machining tough steel, cast-iron, malleable or aluminum, etc., there is a grade of WILLEY'S METAL that meets your needs for maximum efficiency. Specify WILLEY'S METAL and follow the VICTORI SIGN.

WILLEY'S CARBIDE TOOL CO.

318

SAFETY plus a Saving!

them to

cy, the

in weight set so or attacto be a protraction, pad

s as il-

red er

"S Pat

for a

nents

chining

leables

e is a

AL that

LLEY'S

CTORY

higa



Even unskilled hands keep each Super-Sterling Flexible blade in the frame longer. That's because they are made of tough high speed steel—with hardened edge and taper temper back. They take the daily punishment of twisting and buckling without breakage or shattering. Guaranteed against breakage in normal use.

And its a safety blade—cannot shatter to injure eyes, face or hands. Just ask your distributor about Super-Sterling Flexibles and the complete line of Super-Sterling metal saws.

DIAMOND SAW WORKS, INC.

261 Court St.

Buffalo, N. Y.

Super-Sterling
FLEXIBLES



Clayton Boring Bar Holders add extra production hours to every shift by: 1) permitting changes or adjustments of bars without disturbing alignment with lathe, 2) maintaining settings when removed from lathe, 3) providing greater rigidity, 4) eliminating "fingering."

<u>Clayton Boring Bars</u> save tool room time and permit heavier cuts without chatter. Permanently calibrated quarter inch graduations...minimum surface tension...bit holes accurately broached—eliminate vibration, save time.

Speed your war production with Clayton Bars and Holders, Write for complete descriptive matter and prices.

CLAYTON

MANUFACTURING CO.
ALHAMBRA
CALIF.



"C-F" Models 200 and 300 **Welding Positioners**

The Cullen-Friestedt Co., 1311 S. Kilthe Culien-Friestedt Co., 1311 S. Kil-bourn Ave., Chicago, Ill., announces the addition of two giant positioners, desig-nated as the Models 200 and 300, to its line of "C-F" welding positioners. The Model 200 has a capacity of 20,000 lb. 20 inches away from table, 8 inches off center while the Model 300 has a capaccenter, while the Model 300 has a capacity of 30,000 lb. 24 inches away from table, 18 inches off center.

Like other positioners in the C-F line,

the Models 200 and 300 positi ers are mounted on a sin pedestal which is adjustable height. The table of each can be rotated a full 360 a and tilted to any position up 135 deg. off horizontal. E positioners are motorized are operated by a push-but panel, thus enabling the we to swing and tilt weldment any position without the use cranes or handling crew.

ba

on

oco .Oc

Ever Ready "Stick-to Metal" Gummed Label

A series of labels having special gumming which mits them to adhere firmly metal surfaces, to be known Ever Ready "Stick-to-Met

Gummed Labels, has been developed the Ever Ready Label Corp., 141 E. 2 St., New York, N. Y. The labels a available made of paper or linen fab upon which any identification mark label can be printed or written.

Labels of linen fabric are said to useful on metal tools, parts, and m chines as a means for giving insp tion data, instructions, warnings, a so on. Paper gummed labels are signed for use mostly in office pro dure for routing, scheduling, and to bing purposes, and so on.



ding Positi

300 positie on a sin djustable of each full 360 d osition up ntal.

torized a push-but g the wel veldment t the um crew.

Stick-to d Label

a having which p e firmly e known c-to-Met veloped 141 E. 2 labels i nen fab mark

said to and n g insp ings, a s are ice pro and to

n.

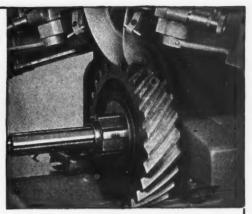
its kind

and cut tersink

High Precision Spur and Helical **GEARS**

Interchange - Quiet

We machine your blanks or cut from bar stock. We cut and grind gears on Maag Machines in our Jersey City Plant to an Accuracy of Profile up to .00012"; of Pitch up to .00024" and concentricity of Pitch Circle, within .0060". Gears cut to usual standards without grinding. (We do not make worm or bevel gears.)



Or Gears cut to usual standards without grinding

SWISS-AMERICAN GEAR MFG.

5001 CHRYSLER BLDG.

NEW YORK, N. Y.



Want a book showing OVER 5000 DIFFERENT FILES? by Grobet

THE "ORIGINAL" SWISS FILE MAKER

The most complete catalog of its kind. Lists 5000 different shapes, sizes and cuts of GROBET Precision Swiss files. Learn more about these Chrome Steel Files that have won a

reputation for utmost precision and durability. WRITE FOR CATALOG KNA

Ask also for catalog KM on Files for Filing Machines; catalog KR on Rotary Files and Diesinkers Burs GROBET FILE CO. of AMERICA NEW YORK CITY

ary, 194 January, 1943



Berger-Bricker Payl Calculator

hourly rates of from 50c to \$1.7a, a half-cent spread tween rates. It ers all time prup to 104 hours divisions of one-to fan hour. The culator is handson constructed of a quered wood and designed for easy ting into a didrawer.

Berger-Bricker Pay Roll Calculator

Pay rolls and job costs are said to be figured in a fraction of the usual time through the use of the calculating device illustrated herewith, product of the Berger-Bricker Co., 433 S. Spring St., Los Angeles, Cal. Operating on a simple new principle, the device includes all

American Nickeloid Electro In Plated Steel

Electro zinc plated steel which is a to serve as a satisfactory substitute more critical metals, including p nickel, tin, chromium, aluminum, a stainless steel, has been added to line of plated metals produced by



221 CENTRE ST. SOSSNER 29 BROADWAY LYNBROOK, L. L.N.Y.

105 D

ALWAYS Dependable

er Pay

ours one-The andao of h

tro Zin ch is s stitute f

d by

are

es.

2

#3

WAY

I., N.Y.



Made by G. W. GRIFFIN CO., Franklin, N. H.

You can always depend on GRIFFIN HACK SAWS. No matter what the metal cutting job is there is a GRIFFIN BLADE that will satisfy. Insist on GRIFFIN from your distributor.

JOHN H. GRAHAM & CO., INC.

General Sales Agent

105 DUANE ST.

NEW YORK CITY



Madison-Kipp tool makers originated the first really high speed grinder. They know a great deal about the practical side of grinder design and grinder usage. They think the new Model H is the best all around off-hand tool Ander M is the best all around off-hand tool they have ever-tried and we are sure you will agree with them. It's fast (50,000 R.P.M.), more powerful, and has a handler grip. ORDER TODAY!



Please Indicate Preference Rating On Order.

MADISON-KIPP CORP. 201 WAUBESA STREET MADISON, WISCONSIN American Nickeloid Co., Peru, Ill. As the name implies, zinc plated steel is steel which is electroplated with a coating of zinc. The zinc provides a protective coating to the steel base metal, thereby making it highly resistant to corrosion and rust. According to the manufacturer, zinc plated steel can be bent, stamped, formed, drawn, soldered, and spot welded to meet most production requirements.

American Nickeloid Electro Zinc Plated Steel is supplied in flat sheets in sizes up to 36 x 96 inches, in a full range of gauges and tempers, and with pollshed, unpolished, and satin finishes. The zinc coating, which is guaranteed against cracking or flaking, can be varied in thickness to meet the requirements and specifications of each appli-

Elemoto Siide

cation.

Designed for use by foremen, designers, specifiers, mechanics, metal workers, machinists, and so on, the Elemento Slide shown herewith is now being offered by The Elemoto Sales Co., Teaneck, N. J. The slide, which requires no special instructions to use, is of

durable heavy gauge coated board construction. Drawings, disions, and figures are white again





Elemoto Slide

blue background.

The front side of the Elemoto S shows U. S. Standard dimensions coarse and fine thread series. When



In addition there are more than 50,000 Cullman Sprockets in stock ready for immediate shipment. Send for Cullman catalog of essential information to sprocket users.

CULLMAN WHEEL COMPANY

352-V ALTGELD STREET

CHICAGO, ILLINOIS

C.W. CO.

e h

mo

gue

. 1

ma Ear

ha

e Av

pe siz RE

F

anua



ngs, d

te again

S. STANDARD

DRUFF KIYE

AN ST'D PIPE THE

moto S

When

ER

and

ring

nce

liv-

TUOT

ore

ck-

-ibe

nan

ion

ary, M

Federal Taperlock Plastic GAGE HANDLES

IMMEDIATE DELIVERY

- Made of durable plastic material, they are lighter than any metal used for Gage Handles. This light weight makes gages more sensitive to touch and reduces fatigue caused by long continuous use, particularly in the case of women inspectors.
- Insulates from bodily heat, helping maintain accuracy of gages.
- Made to fit gages of standard sizes.
 Easily marked for identification with the same lettering stamps used for metal handles.
- Low cost represents a real saving. Available in 6 standard sizes, in any quantity and without delay.
- IN COLORS! I A new feature. Color permits quick identification of type or size without measuring. Furnished in RED—YELLOW—GREEN—BLACK.

FEDERAL TOOL CORP.
404 North Leavitt St.
CHICAGO

TAMALOY TIPPED STANDARD CARBIDE TOOLS

The styles illustrated will handle 80% of all your turning and boring jobs and are carried in stock for immediate delivery.

One price for all quanti-

Tips for formed tools available in Tamaloy Carbide-formed to within .015 of your form dimensions. A fast and simple way to make your own formed tools. Quick delivery.

Write for catalog and prices.



CIRCLE TIP TOOL CO., INC.

65-67 Colden St.

Newark, N. J.





325

Thanks a million...... you've saved us an indefinite tie-up

Words like the above have meant much to us at Threadwell. Months ago we knew that it was not enough to have all our wheels turning. We knew it was not enough to sort and pile and route the orders according to priority ratings. That was expected of us. But we felt that we could do more than that. We felt we could and should break bottlenecks by giving PERSONAL ATTENTION to each order. We have done so. And it has produced results. It has (in some cases) put taps onto the job the next day instead of months later. In all this we have worked hand in hand with a great expediting force . . . our Threadwell distributors. We share with them the satisfaction of doing more than was expected of us.



slide inside the housing is moved to right or left, the correct dimens for each size from No. 0 to 1½ in are placed at windows in or near drings. All required dimensions such threads per inch, basic pitch diamente head sizes, and so on, are instantly accurately obtained with one read This same side of the slide also included in the same side of the slide also included in the same side of the slide also included in the same side of the slide also included in the same side of the slide also included in the same side of the slide also included in the same side of the slide also included in the same side of the slide also included in the same side of the slide also included in the same side of the slide also included in the same side of the slide also included in the same side of the slide also included in the same side of the slide also included in the same side of the slide also included in the same side of the slide also included in the same side of the slide also included in the same side of the slide also included in the slide als

The upper section of the back of Elemoto Slide is used to obtain dimsions for U. S. Standard and Woodn keys. The lower section is used to termine American Standard pipe the dimensions. The back of the slide a contains a table for changing meters to inches and a table of the drill and steel wire gauges.

B-C Motorelay

Designed for use with any float contact device where the control of rent exceeds the contact rating of

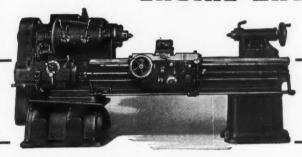


B-C Motorelay

control instrument, the B-C Motors shown herewith has been placed on market by the Barber-Colman Co., Loomis St., Rockford, Illinois.

Construction features include a shat pole, reversible, geared head motor, tally-enclosed switches, and switch mechanism. An enclosed type drasteel cover for the unit is available order. Switch contacts have a minductive load capacity of 10 ample at 110 or 230 volts a.c. Control circurrent is 0.35 ampere at 25 volts.

BOYE & EMMES ENGINE LATHES



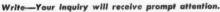
THE BOYÉ & EMMES MACHINE TOOL CO. CINCINNATI OHIO



Get Facts Now on DRILL JIG BUSHINGS and other Precision Items

* A simple stroke of the pen . . . your signature affixed to a set of specifications will bring quick information on Acme's two complete bushing standards . . . the A.S.A. (American Standards Ass'n.), and the Acme Standard. Because of this larger line of bushings, special requirements are often found to be standard at Acme.

In addition to the manufacture of drill jig bushings, Acme also offers many other precision items, such as Dowel Pins, Liner Pins and Bushings, Screw Machine Reamers, Limit Gages and Lightwave Measuring Equipment. Other Acme services include Precision Grinding, Flat and Cylindrical Lapping and the manufacture of hardened and ground parts to order. parts to order.





ACME INDUSTRIAL COMPANY

Makers of Standardized Jig and Fixture Bushings MONroe 4122 Chicago, III. 212 N. Laflin St.

oved to dimensi 11/4 inc

near de ns such h diame stantly ne readi

so inclui ions and ard gau steel. ack of ain dim Woodn sed to pipe thr slide a ging m e of tw

y floati ntrol a

ing of

Motore ed on Co., a shad notor.

switch e dra

ilable 8 1

ampe

ol cira lts.

Foster Superfinishing Attachment

A portable superfinishing attachment for cylindrical work has been developed by the Foster Division of the Interna-tional Machine Tool Corp., Elkhart, Ind. The attachment is designed for use on the cross slide of engine and turret lathes and is capable of developing an extremely accurate and fine surface finish (2 to 5 micro-inches as measured with a profilometer) on a wide range of miscellaneous or production work. The only additional equipment necessary for performing superfinishing operations with the attachment is the stone lubricant supply, which consists of a small pump, reservoir, and necessary piping.

According to the manufacturer, the Foster Superfinishing Attachment, by the use of both coarse and fine abrasive stones, can superfinish to the desired dimension work that has only been turned. In addition, the attachment can be used to eliminate defects not usually visible to the eye but injurious to bearing, such as grinder feed spirals, chatter marks, grinder flats, and other defects caused by machine inaccuracies.

The Foster Superfinishing Attachment is equipped with a variable speed fractional horsepower motor for driving the

oscillating mechanism and is available oscillating in four different sizes designated at Nos. 0, 1, 2, and 3. The No. 0 is ommended for superfinishing work 34 inch in diameter and has an osci tion travel of 1/8 inch and maxim speed of 550 oscillations per minute. No. 1 is designed for use in perform superfinishing operations on work in % to 3 inches in diameter. This attu ment has an oscillation travel of and a maximum speed of 450 oscillation per minute.

The No. 2 superfinishing attachmen recommended for superfinishing on tions on work from 3 to 7 inches in ameter and has an oscillation travel inch and maximum speed of 450 a lations per minute. The No. 3 atta ment is recommended for work 7 ind in diameter and above and has an o lation travel of ¼ inch and maxim speed of 375 oscillations per minute attachments are provided with a spi pressure to the stone, this pressure ing variable to suit finish requirement

Leonard "Micro-Scale"

special mall be centers

ers, etc.

Size N

1A 2A 3A 4A 5A

TYPE

Adap long

Size No

2X 3X 00 0

(Oth

Har

lanuary,

Designed for use by aircraft. nance, electrical, metal, and other w



FOR Precision • Strength SPECIFY MAC-ITS

Mac-its are heat-treated to multiply the strength of every ounce of steel used in them. Designs that take advantage of these stronger screws save man-hours, machine-hours and metals.

STRONG, CARLISLE & HAMMOND COMPANY Cleveland Ohio

DAKU TOOLS FOR SAVING TIME

B availa ated as

. 0 is n

work up an oscil

maxim ninute. perform work in his attac of A

oscillatio achment

ing op ches in travel f 450 a 3 atta k 7 ind s an os

inute.

a spri essure l

e" raft. her wo



TYPE A-STEP JAW DESIGN

maxim specially adapted for holding work with mall bores while being machined between tenters on lathes, grinders, millers, shap-ers, etc. uiremen

Size No.	Range of Bores Taken	Net Price
1A	1/2" to 1"	\$12.00
2A	1" to 11/2"	16.00
3A	11/2" to 2"	23.00
4A	2" to 3"	34.00
5A	3" to 4"	40.00



TYPE B-STRAIGHT JAW DESIGN

Adapted for work with both short and long bores.

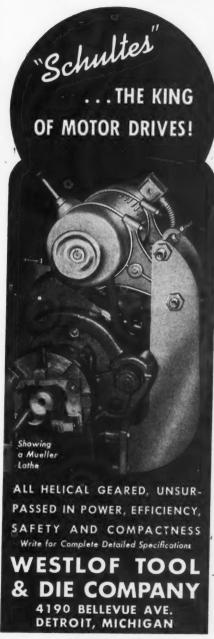
Size No.	Range of Bores Taken	Net Price	
1X	1/2" to 18"	\$10.00	_
2X	%" to 21/32"	11.00	
3X	21/32" to 3/4"	12.00	
00	3/4" to 7/e"	14.00	
0	%" to 1"	16.00	
1	1" to 11/4" 11/4" to 11/8"	18.00	
2	11/4" to 11/4"	21.00	
3	118" to 2"	29.00	
4	2" to 21/2"	40.00	

(Other Sizes Taking Up to 7" Bores)

Hardened tool steel, accurately ground. Sold singly or in sets. Prompt delivery. Write for bulletin.

W. H. & CO.

> 136 OREGON STREET WILKES-BARRE, PA.



Foster Superfinishing Attachment

A portable superfinishing attachment for cylindrical work has been developed by the Foster Division of the International Machine Tool Corp., Elkhart, Ind. The attachment is designed for use on the cross slide of engine and turret lathes and is capable of developing an extremely accurate and fine surface finish (2 to 5 micro-inches as measured with a profilometer) on a wide range of miscellaneous or production work. The only additional equipment necessary for performing superfinishing operations with the attachment is the stone lubricant supply, which consists of a small pump, reservoir, and necessary piping.

According to the manufacturer, the Foster Superfinishing Attachment, by the use of both coarse and fine abrasive stones, can superfinish to the desired dimension work that has only been turned. In addition, the attachment can be used to eliminate defects not usually visible to the eye but injurious to bearing, such as grinder feed spirals, chatter marks, grinder flats, and other defects caused by machine inaccuracies.

The Foster Superfinishing Attachment is equipped with a variable speed fractional horsepower motor for driving the oscillating mechanism and is availating four different sizes designated as Nos. 0, 1, 2, and 3. The No. 0 is nommended for superfinishing work which is not in diameter and has an oscillation travel of 1/2 inch and maxim speed of 550 oscillations per minute. No. 1 is designed for use in perform superfinishing operations on work in 1/2 to 3 inches in diameter. This attachment has an oscillation travel of 1/4 in and a maximum speed of 450 oscillation per minute.

The No. 2 superfinishing attachment recommended for superfinishing options on work from 3 to 7 inches in ameter and has an oscillation travely inch and maximum speed of 450 as lations per minute. The No. 3 attachment is recommended for work 7 individual in travel of 1/4 inch and maxim speed of 375 oscillations per minute, attachments are provided with a springer pressure to the stone, this pressure ing variable to suit finish requirements.

Leonard "Micro-Scale"

Especial

mall bo

enters

ers, etc.

Size No

TYPE

Adap long

2X

3X 00

(Oth

Ha

Pro

January

Designed for use by aircraft, an nance, electrical, metal, and other wa



Cleveland

Ohio

TANDARD TOOLS FOR SAVING TIME

ted as f

work up

maximulation in the state of finite in the state of finite in the state of finite in the state of the state o

oscillation chment

ng open ches in i travel f 450 ose 3 attack k 7 inch s an ose

maximu

nute. 1 a spri essure i

iremen

e"
aft, cher wo



TYPE A-STEP JAW DESIGN

specially adapted for holding work with small bores while being machined between centers on lathes, grinders, millers, shapers, etc.

Size No.	Range of Bores Taken	Net Price
1A	1/2" to 1"	\$12.00
2A	1" to 11/2"	16.00
3A	11/2" to 2"	23.00
4A	2" to 3"	34.00
5A	3" to 4"	40.00



TYPE B-STRAIGHT JAW DESIGN

Adapted for work with both short and long bores.

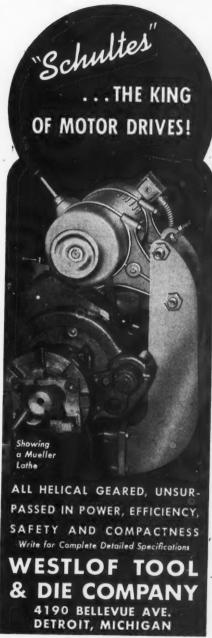
Size No.	Range of Bores Taken	Net Price	
1X 2X 3X	1/2" to 16" 16" to 21/32"	\$10.00	-
2X	%" to 21/32"	11.00	
3X	21/32" to 21/32"	12.00	
00	3/4" to 7/8"	14.00	
0	%" to 1"	16.00	
1	1" to 11/4"	18.00	
2	11/4" to 118"	21.00	
3	1 16" to 2"	29.00	
Marie 4	2" to 21/2"	40.00	

(Other Sizes Taking Up to 7" Bores)

Hardened tool steel, accurately ground. Sold singly or in sets. Prompt delivery. Write for bulletin.

W. H. NICHOLSON & CO.

136 OREGON STREET WILKES-BARRE, PA.



Y

ary,



Gather Your Rightful Profits

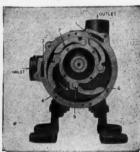
By Using the World's Champion in

LEIMAN BROS. PATENTED

VACUUM PUMPS

Also Used as Pressure Blowers, Gas Boosters, and Āir Motors.

They Take Up Their Own Wear



LEIMAN BROS. INC.

TOTAL

Newark, N.J.

ers in quickly and accurately measurementer distances, a magnifying manist's scale designated as the Leon "Micro-Scale" is now being marked by the L. V. Fox Co., Inc., Washington, C.

As shown in the accompanying the tration, the unit includes a patented breakable plastic lens which can be a

Desi

snar

quic or or throu sma inch

Provi Two Conv Inter

240

Pro

E

The

can

loss

It a

thic

con



along the scale and focused so as magnify fine divisions, such as a M of an inch, to approximately four time their normal size, thus enabling it user to easily measure to a few the sandths of an inch. The unit is structed so that it can be readily a ranged for convenient carrying in pocket or placing in a toolbox.

Styles 39 and 40 Kennametal Tools

In answer to the demand for stee cutting carbide tools having a lead a gle, the McKenna Metals Co., 300 Lin Ave., Latrobe, Pa., has added two tool designated as the Styles 39 and 40, its line of Kennametal tools. These too combine the lead angle or side cutting edge angle with a tip which is long than customarily used on carbide too having a lead angle. The Style 39 to illustrated is a left-hand type while Style 40 is a right-hand tool.

Styles 39 and 40 Kennametal Tools as said to be particularly useful in performing shell turning operations, since out the edge on the lead angle requires sharpening, also because the control position of the nose can be easily main

MODERN MACHINE SHOP

January,

A PRECISION AMIC COMPARATOR INDICATING GAGE

Designed to replace special gages, flush pin gages. snap height gages. For accurate, convenient and quick checking of components, either in the tool room or on the production line. Permits precise gaging throughout the whole day without eye fatigue. Each small line on the scale represents 1/10,000th of an inch.

A REMARKABLE IMPROVEMENT

Clear reading on 6" scale, with inch and millimeter readings. Magnification is 1000. Measuring capacity is plus or minus .003" and plus or

minus .05 mm.

measuri g mach

e Leons market

ashingt ying illu

tented u

an be

50 AB S & 6 ur tim

ling t ew the dily a

ng in

etal

r steel

ead a

O Llow ro took

1 40, 1 se to cuttin long le tool 39 to le Sty

ols at

erform ce on equin rol p mais

minus to thin.

Pointer comes to rest immediately.

Pointer moves in the plane of the scale, thus avoiding any error in measuring due to parallaxis.

Provision for convenient lifting of the contact pin.

Two fine adjustments for easy setting.

Convenient red mark limit hands control tolerances.

Interchangeable backstops and accessories.

Our Extensive Experience Will Solve Your Measuring Problems.



AMERICAN MEASURING INSTRUMENTS CORP. 240 West 40th St. New York, N. Y.

Manufacturers of Gages, Jigs, Fixtures and Service Tools

Production Vise with Adjustable Pressure

Eliminates Distortion Spoilage

The Presto-Vise has a great advantage over ordinary production vises because its jaw pressure can be adjusted according to the type of metal that is being clamped, thus eliminating spoilage losses due to distortion of parts.

It also has a toggle-linkage feature which insures uniform pressure regardless of differences in thickness of the parts being clamped. And it is convertible into a drill jig by the use of various attachments provided with the vise.





CATALOG 8085 Livernois

D. A. SMITH & CO.

Detroit, Mich.



THEY HELP YOU Maintain Peak Production

With your machines now forced to the limit to gain peak output, the necessity of stopping for repairs becomes much greater. You can prevent many of these costly interruptions of production by using KANTI-LEVER Couplings, for they have a scientifically designed Cushion Torque that absorbs sudden load shock and torsional vibration the two main causes of wear, fatigue and failure of machinery. The KANTI-LEVER is different from any other type and gives your machinery a protection that is vitally needed under present abnormal conditions. See cut showing 70 KANTI-LEVERS that have proved invaluable to their user by protecting the driven machines and enabling steady production for over 18 years.

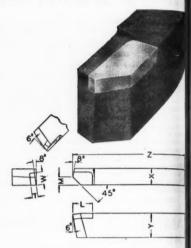
Send for Bulletin No. 28-M Describing

Kanti-lever Couplings



BROWN HIROST

tained as tools are reground. Accord to the manufacturer, the tools are be widely used in shell turning where to form forgings permit the depth of



Style 39 Kennametal Tool

never to exceed the length of the having a lead angle. The chip brais is ground only on the section parallel this lead angle. The tools, which available in sizes of ½ x ½ x ¾ 1½ x 3¾ 1½ x 2 x 14 inches, may also be used it chamfering operations.

Whitney-Jensen G742 Blind Rivet Puller

A handy tool designed for use in a plying blind rivets, to be known as a Whitney-Jensen G742 Blind Rivet Pulls



misalignment. Saving of \$\$\$ and delays. No lubication—no servicing. LOW COST. Send for caroling.

LOVEJOY FLEXIBLE COUPLING CO. 5007 W. Lake St. Chicage, III

BR

Throu of Pat

thorou mal si SP400

PENE Easily to nev

ΒR

Accord s are be where u pth of s

the break arallel hich s x 31/3 : used fi

lind

e in and in as the Pulle

Used

ATION

E-FREE

1/6 to

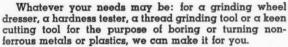
Corrects lo lubricatalog.

CO.

ry, 19



A GILMORE DIAMOND TOOL for Every Shop Requirement



We are geared to the demands of war production. We number among our customers, some of those industrial concerns who hold the largest primary contracts. Let us demonstrate the durability and dependability of Gilmore Diamond Tools in your plant—let us help you increase your own output through the use of Gilmore Diamond Tools which are exceptional in quality and distinctive in performance.

Write for information today.



Manufacturers of Diamond Tools

285 Columbus Avenue Boston, Mass. 2834 E. Grand Boulevard Detroit, Michigan





MODEL SP400
BRADY-PENRO

SELF-PRIMING CENTRIFUGAL
COOLANT PUMPS

"They Pump Air"

Through clever application of the fundamental principle of Patent No. 2,164,869, these pumps are simple in design, thoroughly dependable and instantly self-priming on normal suction lifts encountered with machine tools. Model SP400 is sturdily built, with all the superior BRADY-PENROD features, to handle abrasives and steel chips. Easily installed on present machines or quickly adapted to new machines.

Send for FREE Bulletin

BRADY-PENROD, INC.

1208 W. Second Street, Muncie, Indiana

January, 1943

RESERVOIR

TERMINAL BOX PRIME PLUG NP TO BE PRIMED ONLY HEN FIRST INSTALLED

SUCTION

LIQUID LEVEL

has been placed on the market by Whitney Metal Tool Co., 110 Forbes St., Rockford, Ill. The tool is sturdily con-



structed and has a ball bearing feature which is said to decrease friction and increase speed of operation.

The Whitney-Jensen G742 Blind Rh The Whitney-Jensen G12 Blind in Puller is available with interchanged chucks for handling 16, 18, and 1 his flush or brazier blind rivets. The weighs 4 lb. and has an overall him with brace handle of 15 inches and overall height without brace handle 7 inches.

Murray "Grid" Unit Heater will Cast Iron Heating Sections

In cooperation with the war effort conserve vital materials, the D. J. h ray Mfg. Co., Wausau, Wis., announ that its "Grid" Unit Heater is now ing made with cast iron heating a tions instead of aluminum sections heretofore.

According to the manufacturer, in new heater, which is available in sizes, is engineered along the same as the heater with aluminum heat sections and is designed to withstand to 250 lb. steam pressure. The hear with cast iron heating sections is a said to be free from electrolysis wi causes corrosion, leaks, and breakdow since only one type metal comes in tact with steam or hot water.

DIE-LESS DUPLICATING



In many cases you can make duplicated parts faster with the "Di-Acro" system, and save Man Hours and Critical Materials. In illustration from left to right: 1st—Di-Acro Shear squares and sizes material, cuts strips, makes slits or notches. 2nd—Di-Acro Brake forms angles, channels or "Vees." 3rd—Di-Acro Bender bends angle, channel, rod, tubing, wire, resulding strip strips toke at moulding, strip stock, etc.

O'NEIL-IRWIN MFG. CO. 306 8TH AVENUE S. MINN.



To Sa

bday ti

al—to

accuro e Bart

rperiez

oring b

iminat

erience

his Ga achine

auge,

214

DOI when

Quic

in y

take

ply ;

ALL I Tape Stan with

Se

An almost unlin variety of works the combined us these 3 Di-Acrou High hourly pro tion rates cm easily maintain Multiple units ; vide large out desired. All di cated work is a rate to .001"





Tool Setting Gauge Saves Time-Labor

lind Ri hangeal

The to all heir s and

handle

. J. M

nnoun

ting a

urer, f

e heat s is a

is whi kdow s in c

work done ned us Acrous

y pro

inits ;

out All de

k is a

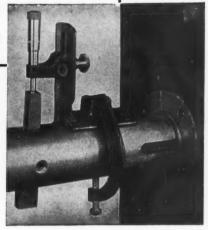
now

er with oday time is too vital—labor too essenal-to risk the waste of both because of ions accuracies in setting boring tools. Here e Bartelt Tool Setting Gage enables ineffort be built and women to accutely and speedily set cutting tools in oring bars.

roduction is speeded, costly errors are ctions iminated, and the facilities of the inexerienced are utilized advantageously. his Gauge may also be used for milling

in el actione setups, planer setups, as a height maje, as a depth gauge, as a depth gauge, and for layout stand and inspection.

Send for illustrated literature



ENGINEERING COMPANY

214 PARTRIDGE AVENUE

BELOIT, WISCONSIN

DON'T SEND IN A SUBSTITUTE!

when you can use a star performer

Quick deliveries through saving of time and labor in your toolroom are important for Victory. Don't take chances with substitute materials. Let us supply you with -

ALL METAL HANDLES for your PLUG AND THREAD GAGES

Taperlock and Trilock types. American Gage Design Standard. Made accurately for interchangeability





SEND FOR PRICE LIST H

AURELIO TANZI ENGINEERING COMPANY 430 JEFFERSON STREET . BROOKLYN, N. Y.

KAR CHUCKS

Permanent Magnet Type

Available for Immediate Delivery From Stock



How They Work





I BERNARDET ME-BARRETHS

Top plate is constructed of a series of identical pole pieces, uniformly separated by gaps formed by non-magnetic metal, into which pole pieces are cast. Gaps between pole pieces are small at work surface, but open out to a width greater than that of magnetic elements at lower surface of top plate. Therefore, when magnetic elements are shifted from work holding position to release position, flux path is broken, as shown by arrows, and work is released.

Cannot Fall Have No Electrical Connections **Generate No Heat**

Can Be Used Wet or Dry Retain Their Holding Power Hold Work TIGHT **Release Easily**

Model 618-6" wide x 18" long x 33/4" high. Model 824-8" wide x 24" long x 31/4" high.

Write for complete details



Furnas Reversing Drum Control with Built-In Thermal Overload Unit

Designed for use with machines other operating units, a revendrum controller with built-in polyn thermal overload unit has been plon the market by the Furnas Electron, 443 McKee St., Batavia, In the event of an overload, power a connected independently of the re-



Furnas Reversing Drum Controller with Built-In Thermal Overload Unit

ing part of the controller, and an or load is signaled by a red indica which projects through the top of controller housing.

The overload unit, which is of solder-pot type, is trip-free and cam be reset and power reconnected with drum handle has been returned to position.

American "Upsy" Drum-Loading Truck

A drum-loading truck to be known the "Upsy" has been added to the of pressed steel hand trucks marked by The American Pulley Co., 4200 W sahickon Ave., Philadelphia, Pa. I truck is designed to provide a st

1. 1

4.

5.

2 Taper No.

January,



mal

100

er wii

an or indica o of of f ed u d to

adin

OW arketi 00 Wi

. 1

PADDOCK **Ball Bearing** BANDSAW GUIDES

Reduce Blade Breakage Increase Production

Easily adjusted to all sizes of plades to 11/2" wide.

Recommended for new and old machines running at any speed cuting all materials.

Shipped on 10 day approval

PADDOCK TOOL CO.

418 WALNUT ST.

KANSAS CITY, MO.

MARK IRON. STEEL and CARBIDES



THE ORIGINAL Etchograph

Mark tools, dies, gages and fixtures of any ferrous metals including the hardest alloys and carbides—quickly—plainly.
Three sizes to meet all requirements. Also a combined Etchograph and Demagnetizer.

Write for circulars and prices.

40 CHURCH ST.

NEW YORK

LOOK AT THESE FIVE

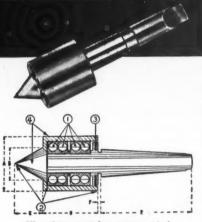
of QUADRO Precision LIVE CENTERS

FEATURES . . .

1. FOUR ROWS of precision BEC-4 specification hearings.
2. SRONT OVERHAND assures rigidity and accuracy—sliminates "chatter."
3. Positive FELT-SEAL excludes dirt and retaine lubrication.
4. HANDENED AND GROUND CONE. Point accurate to within .0022".
5. HEAVY DUTY. Note combined radial thrust load at 100 r.p.m.

DIMENSIONS

Taper No.	A	В	С	D	E	Combined Radial-Thrust Load At 100 R.P.M.	Net Price
2	1%	36	%	111/10	2%	1600	\$23.00
3	1%	36	%	111/s	3%s	3300	\$25.00
4	21/40	15/16	13/18	11%	4%2	7500	\$35.00
5	2%a	1%	1	21/s	5%ia	12000	\$47.00



All orders must be accompanied by extendable priorities.

WRITE TODAY!

FISHER TOOL CO.

226 LAFAYETTE ST. NEW YORK, N. Y. quick, and easy means for handling drums, barrels, kegs, and other con-tainers having chimes or beads, and has a capacity for loads weighing up to 1,000 pounds.

In use, a sliding hook on the center rail of the truck catches on the top bead or chime of drum or barrel. The operator then pulls down on truck handles, tilting the drum toward him and thereby permitting nose prongs of truck to slide under the bottom bead of the drum. As handles are lowered to trucking position, the nose prongs lift the drum off the floor and load is ready to

MARK IT with THOR STAMPS



If you're in the market for a stamp that will mark clearly and uniformly — try THOR STAMPS. They're made of special, tough alloy steel, correctly hardened to withstand any punishment you can give them. WRITE FOR DETAILS.

The Pittsburgh Stamp Co., Inc. PITTSBURGH, PA.

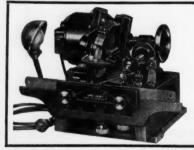


American "Upsy" Drum-Loading Trud

be moved. The sliding hook of the is adjustable from 16 to 40 inches, t enabling containers of various sizes be handled.

Drive-All Motor Drive

Especially designed for motorizing model belt-driven Cleveland Automati a drive consisting of only one electron motor to drive all the units of the si mentioned type of machine instead two or three motors as formerly



PRODUCTION HIGHER from SHARP TOOLS

The Howe Lindsey Automatic Sharpener will keep your hack, band or slitting saws sharp at a minimum expense.

Can also be used as a cutting-off machine on wire, etc.

HOWE & SON, INC. • Hinsdale, N. H.

338

Comb

Etchir

est st One o

for 15

Lum

DEPT.

g Die

Ring:

S.A.E Stain

KALA



Send for Valuable Booklet

Forgings for All Industries

Rough Turned or Finished Complete

Composite Die Sections, Extrusion Tools, Crankshaft Forgings, Gear Forgings, Die Cast-Ing Dies.

Rings, Discs, Blacks, Shafts, Hubs, Bars, and Special Shapes. Tool Steel of All Makes. S.A.E. Specifications.

Stainless and Copper Forgings.

MAY WE SERVE YOU?

AJAX STEEL & FORGE CO.

205 ADAIR ST.

Truck

sizes

e

izing

elect

he af

erly

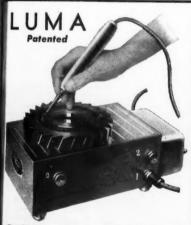
NC

ener

QWS

hine

DETROIT, MICHIGAN



Combination Demagnetizer and Electric Etching Pencil. Marks symbols in hardest steel. Demagnetizes instantly. One of our models popular in tool rooms for 15 years.

Luma Electric Equipment Co. DEPT. MS TOLEDO, OHIO

Comfortable Seating Helps Their Efficiency



Give Them

HALL()WELL

WOOD STOOLS

Made carefully of selected wood, firmly glued. Five sizes: 18", 21" and 24" with one set of rungs: 27" and 30" with two sets. Can be supplied with or without backrests having 3" vertical adjustments. Get our illustrated bulletin that gives complete details.



Fig. 1927

Standard Pressed Steel Co.

BOX 556

JENKINTOWN, PENNA.

quired, is announced by the Drive-All Mfg. Co., 3410 Conner Ave., Detroit, Michigan.

The gearbox and motor are attached to the machine by means of brackets, which also support the jackshaft that drives both the pump and feed. A 1½-inch square bar running the full length of the machine provides a base on which to mount the various brackets, which are standard.

The Drive-All Motor Drive is said to be equally well adapted to other automatic machines, converting them into self-contained production units.





& MFG. CO.

WRITE FOR STOCK LIST

CHICAGO

Steel-Grip Finger Guard No. 14

A finger guard, or finger stall, a bining tough leather and flexible in has been designed by the Indus



Steel-Grip Finger Guards No. 1418

Gloves Co., Danville, Ill. The gu which is known as the Steel-Grip if ger Guard No. 14169, is said to be a fortable and clean to wear, light weight, and unusually durable, and a be easily put on or taken off.

be easily put on or taken off.

The guard is designed to afford a tection to the fingers and thumb operators of stamping-out presses, semblers of small parts, book bind buffers, polishers, sanders, grind trimmers, mechanics, and machine



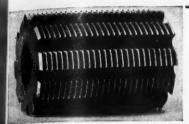
Equip your drilling department with SHUR-Giff and reduce non-productive time—hold all supsecurely—fast and convenien—hardened jam? wide open 5". Send for details.

JOHNSON TOOL CO., INC.
Massasoit Ave., East Providence, R. I., ILL

2326 S. CANAL ST.

—in scal thre

TOL



No. 14

stall (

ible h

r Gun

-Leathe

-Laste

14169

Frip I be a

light and

ford i

umbi

binde

hine

Price 115.50

R-GIR I shope jawn !

ry, l

MULTIPLE THREAD MILLING HOBS

—in any thread system, any thread angle, any thread form. Inch or metric scale. Left or right hand threads. Free from distortion. Up to 7" O.D., and 4" thread length for internal or external threading.

TOLERANCES: CUT ON MACHINES ADJUSTABLE FOR TOLERANCES UP TO 1/10,000
ALL HOBS DEMAGNETIZED RELIEVING CHIPS IMMEDIATELY

These hobs precision cut by methods used for more than 25 years, eliminating any discrepancy between thread form and form of finished work, thus speeding up production without sacrificing accuracy. Full details upon request to Dept. T. Delivery Time: From 1 Week On.

FOR QUICK ACTION CALL PLANT AT CLINTON, INDIANA, TELEPHONE 85.

U. S. MACHINE TOOL MFG. CORPORATION
100 SO. 6TH STREET TERRE HAUTE, IND.





The WALTHAM Thread Miller will cut V, N.S., Acme, Whitworth and Metric threads, special threads... up to 2" diameter. (Insert above shows special head for internal threading.) Special head for relieving can also be furnished.

Write for new bulletin No. M.

WALTHAM MACHINE WORKS, Waltham, Mass.

Also Small Milling Cutters, Sub Presses,
Pinion and Gear Cutting Machines.

Accurate, High-Speed STROKE STROKE STROKE VERTICAL SHAPERS SELF-CONTAINED MOTOR DRIVE FEATURES: Precision Easily handledyour operators will appreciate it Cutting Stroke changed quickly . . . Feeds instantly varied

MOREY MACHINERY CO., INC.

erators, both women and men. hextra protection, it may be worn und a glove.

If worn with the leather on the base of the fingers, the Steel-Grip Fing Guard protects knuckles from raps, and abrasions. The illustration sho guards consisting of grain leather a lastex. Guards are also available heavy split leather, lightweight in leather, or wool felt. The lastex is ture makes the guards snug fith flexible, and porous for ventilation.

G-E Safety Clothing for Women Welders

A complete line of safety clothing a signed especially for women welding erators has been announced by the Ga



Girl Welding Operator Wearing Several Piece of G-E Safety Clothing for Women Welden

eral Electric Co., Schenectady, N. I. Featured in the line are leather sleeve aprons, jackets, leather gloves, and special women's head and hair coving which protects the hair from spath and slag and can be used with any of the modern welding helmets. According

PORTABLE ELECTRIC HONING and FILING TOOL

orn und

the h p Fine aps, cut on sho

ther e

ilable ight h stex for

ation

Vomen

hing de

lding op

(RECIPROCATING ACTION)

Eliminates Hand Operations!

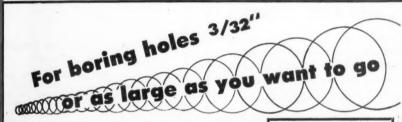
MODEL C-3/4" STROKE MODEL E-1/a" STROKE

Conserves time and energy by mechanically reproducing the natural push and pull action of hand operations...filing, honing, polishing, sanding, sawing, etc....when equipped with the proper accessories. Will prove a boon to every Tool, Die, Mold, and Machine Shop.

Prompt delivery from stock! Just off the press—Precision Production Tool Catalog No. 42

ACME TOOL COMPANY

200 CHURCH STREET NEW YORK, N. Y.



There is a Bokum Boring Tool available to meet any size requirement up to the capacity of the machine on which the tool will be used, from diameters of 3/32" to infinite diameters.

Send for folder B-1139 giving complete range of sizes and prices.

BOKUM TOOLS

Bokum Tools are made for three distinct purposes: (1) Style A, for general boring, (2) Style B, for facing and bottoming, and (3) Style C, for internal threading.

BUY WAR BONDS



BOKUM TOOL CO. 14775 Wildemere Ave.

Detroit, Mich.

l Pieces

elden

N. Y. leeves, and a

COVETsparks

any of ording

y, 190

to the manufacturer, all items are made of high quality material, are comfortable to wear and light in weight, yet provide full protection for all parts of the body.

Anti-Fog Lens Pencil

To help prevent safety goggle lenses from fogging, the American Optical Co., Southbridge, Mass., is now introducing the Anti-Fog Lens Pencil shown in the accompanying illustration. Use of the



For rapid Precision marking...

THE PANTO ENGRAVER, ELECTRICAL MARKER, AND ACID ETCHER

Pantographic bench-type machine with interchangeable heads for three classes of work. Accurate, easy to operate, built for long reliable service.

> Write for literature

H. P. PREIS ENGRAVING MACHINE Co. 149A SUMMIT ST. NEWARE, NEW JERSEY



Anti-Fog Lens Pencil

pencil is said to provide lenses with cellent anti-fogging qualities over periods of time, thereby adding to efficiency of men working in sta surroundings. According to the ma facturer, the pencil itself is designed last unusually long without crystallis or crumbling.

G-E Indicating Lamp for Buni ing Machine Timer

Especially designed for use in forming shaft finishing operation small indicating lamp arranged mounting on and connection to an a matic timer used on burnishing chines has been introduced by the geral Electric Co., Schenectady, N. The lamp can be connected to

2975

Universal CUTS TOOLING TIME Vise SPEEDS PRODUCTION

A ready-designed drill jig body that shortens tooling time of helps you get into production faster. No complicated odjob ments—the positive, quick-action lever locks work instant holds securely. Only an inexpensive bushing plate at adaptor needed for each job. Only \$29.75 f.o.b. Chicago

Order Today including priority certification.

MOHR LINO-SAW CO.

126 N. Union Street

Chicago

344 MODERN MACHINE SHOP

January,

CATS

chine neale cylind —with

tion.

Cutting through prevenue,



day

s with

over | ing to

in ste

the m

lesigned ystalli

Burni

e in ations nged an an

the G y, N.

IME 101

ime an adius

stanty te on

hicog

hicas

Jary,

T

These CATSKILL Abrasive Cut-Off Machines are cutting gear blanks, unannealed stock, tubing, extruded bars, cylinders, high carbon steel, pipe, etc.—without a secondary finishing operation. Solids to 2" and tubing and shapes to 3".

Cutting wheel runs in a slotted pipe through which coolant is pumped. This prevents surface hardening, burn and burr, and insures a smooth finished cut.

Write for folder.

CATSKILL METAL WORKS, Inc.

Manufacturing Engineers

CATSKILL

NEW YORK

SPECIAL PURPOSE **NUT SLOTTER**

THE MACHINE ACCEPTED BY THE AIRCRAFT INDUSTRY

Slots Sizes at Once



Slots all aircraft sizes and all materials



- 6 CUTTERS MILLING CONSTANTLY
- 2 CONVEYORS RUNNING CONTINUOUSLY
- AUTOMATIC INDEXING
- AUTOMATIC BURR REMOVAL . . .
- AS HIGH AS 3000 SLOTTED NUTS PER HOUR . . . ALL SIZES FROM 3/8 to 15/16 HEXAGON ACROSS FLATS



PELLOW MACHINE CO.

13510 FOLEY AVE.

DETROIT, MICH.



G-E Indicating Lamp for Burnishing Machine Timer

burnishing machine timer in such a manner as to indicate to the operator when the necessary finish on a shaft has been obtained, thus eliminating over processing and minimizing spoilage of work.



Vard Threaded Plug Gages

A line of threaded plug gas ground from special alloy in wearing steel is now being meter by Vard Inc., Passaw keted by Vard Inc., Passaw Cal. The gages are available a full range of sizes from Note of inches diameter and a produced in Standard the forms, National fine, coan extra fine, and uniform set Metric, and special pitches both right and left hat threads. The gages are mades complete units consisting a "go" member, "no go" meber, and handle; however, a member may be obtained a arately.

Reed Knurl Selector Tall

To speed up the selection of knumost widely used for ordinary knum operations, Reed Small Tool Works, be MM, Worcester, Mass., has issued as lector table containing a condensed is ing of the company's complete line knurls, designating the styles in greated demand as "emergency styles." The ble utilizes the slide rule principle to sin



Reed Knurl Selector Table

plify the selection of knurls according size, pitch, and pattern produced, will the catalog number of each knurl show for ease in ordering.

Also included is a table of average in crease in outside diameter for representative knurl patterns, pitches, and toth angles. This information serves as a

THE

on t in th

CHI

with The dut

or v

Januar

mand

Plug

olug gu eing m Pasade

ailahla rom No and a d thre m seri itches eft - h are m sisting o" me ver, a ned se

r Tabl knur knurli s, Den ed a sed lis line a reates The ta to sin



THE ALMOND THREE JAW DRILL CHUCKS were the first to be placed on the market. They were Pioneers in the field of Drill Chucks!

ALMOND THREE JAW DRILL CHUCKS are furnished in 9 sizes with capacities from 3/16" to 1". These are made in heavy and light duty types with a taper arbor hole or with a threaded arbor hole.

> WRITE FOR COMPLETE **DETAILS**

T. R. ALMOND MFG. CO.

ROGERS

SINCE 1885



Conserve High Speed Steel by using Rogers inserted Blade adjustable-forwear Reamers.

M. ROGERS TOOL CORP. GLOUCESTER CITY **NEW JERSEY**

ng ta with

e in-

18 1 190

guide to the engineer or machine operator by providing a simple method of determining how much the diameter of a part is increased by various styles of popular knurls.

Copies of the Reed Knurl Selector Table are available to purchasing agents, superintendents, foremen, engineers, setup men, and operators in plants where knurling tools are used.

Victory Industrial Floor Mat

The illustration shows the Victory Industrial Floor Mat for use in front of lathes, drills, boring machines, grinders, and so on, which is now being marketed by Van's Store Equipment Co., 216 Winchester Pl., Grand Rapids, Mich. According to the manufacturer, the mat is not affected by oil or water and will not "creep" or curl at the edges.

The Victory Industrial Floor Mat is made of soft wood blocks hinged and held together with hardwood dowels, thus making it flexible for easy han-

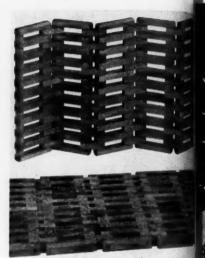
'ALL-WAY" LEVFL



The FELL Precision Level is made to show the level of all ways at once. This eliminates disturbing the first level when leveling the second. Graduations are in .0005" per foot and form squares about a circular bubble, thus giving co-ordinate readings and showing direction and amount of slope, if any.

MADE IN TWO SIZES 51/2" x 12" 31/2" > 31/2" x 6" Write for Bulletin

ROCKFORD, ILL 702 SOUTH ST.



Victory Industrial Floor Mat

dling or cleaning, and is available i standard sizes of approximately 18 x 2 18 x 39, 24 x 51, and 24 x 75 incha Mats up to 3 x 10 feet can be obtained on special order. All mats are 1% inche thick.

Acro 3-Inch Die Cradle

Designed to handle smaller sizes work as well as a wider range of work sizes than the 7-inch die cradle previously announced, the Acro 3-Inch Di Cradle built and marketed by the Am Tool & Die Works, Dept. B, 5324 M Kedzie Ave., Chicago, Ill., is said i provide a safe and accurate means in supporting dies, tools, and so on in drilling, counterboring, tapping, milling or grinding. Like the 7-inch cradle, the unit is made of high grade steel, hard ened and ground to close tolerances to ensure accuracy.

Westinghouse Porcelain Enameled High Bay Reflector

A porcelain enameled high bay reflet tor for general lighting of medium low bay areas in foundries, machine

January, 194

THET

January,



This mid-Western ordnance steel concern, producing armor plate, put Capewell's TECHNITE hack saw blades to a thorough test. They acknowledged their approval with repeat business. Again Capewell cut costs. Capewell blades last longer, cut faster. Order from your mill supply man today.

THE TREND IS TO TECHNITE
THE TREND IS TO THE MOLTBERNUM
HIGH THEM BACK HAVE BLADE

PLAY SAFE



Hold it in a Parker Vise!

Too often when work slips in a vise it means a reject...man-hours wasted, critical materials spoiled.

Wherever you find careful, expensive work in process you will usually find Parker Vises on the job. They are assembled to precision fits, there is no "slack" to take up in gripping or releasing. Pinned-on tool steel jaws cover the top of the vise...resist wear...are easily renewable. The Charles Parker Company, Meriden, Conn., U.S.A.

PARKER VISES AMERICA'S OLDEST shops, power plants, receiving and shipping departments, and similar industrial locations is announced by the Westinghouse Electric & Mfg. Co., Lighting Division, Edgewater Park, Cleveland, Ohio.

The reflector is designed for use with either incandescent or high intensity mercury lamps and is available in either Locklite two-piece quickly detachable construction or one-piece construction for conduit or outlet box mounting. According to the manufacturer, the multiple coat porcelain enameled reflecting surface is permanent, can be easily cleaned, and has a reflectivity of 80 per cent.

Allis-Chalmers "Motor Finder"

Allis-Chalmers Mfg. Co., Milwaukee, Wis., now has available a handy device for use in quickly selecting the various types of squirrel-cage motors included in its Lo-Maintenance line, which comprises over 30 standard types ranging from ½ to 75 h.p. The device, which is designated as the "Motor Finder," is unusually easy to use, only three steps being required to select a motor. By means of the device, the motor user is able to match the conditions under



Allis-Chalmers "Motor Finder"

which a particular motor must open at the proposed installation with a required motor characteristics, their instantly acquainting himself with a right motor type and its features.

The Allis-Chalmers Motor Finder uses to free of charge to motor use addressing a request on their compulation that the computation of the computat

Eastern Superfinishing Service

Eastern Precision Gage Co., Her Tower Bldg., Elizabeth, N. J., a nounces that it is now equipped to omercially Superfinish hardened aparts according to customer specifications. This process is said to put attractive mirror-like finish on apunches and other parts for war of tractors. Customers desiring to have work Superfinished should send a priso that an estimate as to cost can given. The company is also equipped hard chromium plate and resize pagages, and other similar tools.

FILMS

Gisholt Turret Lathe Training Fin

In recognition of manufacturers' in creasing need for skilled machinists with the control of the

THE WONDER CUTTER

Cuts wire or rod up to $\frac{5}{8}$ inch round $(\frac{3}{6}$ inch square) and band iron up to $\frac{1}{8}$ by 2 inches.

Adjustable s t o p for repeated cuts to same length. Hardened cutters last indefinitely. Powerful leverage makes all cuts easy. S m a 11

size permits placing wherever convenient.

Small in size but a giant for work. The lowest priced rod and band cutter on the market. Every shop needs one. Hundreds in use.

You can get one for free trial in your own shop.

Write today for further details and prices!

THE FEDERAL FOUNDRY SUPPLY CO. 4606 East 71th St. Cleveland, Ohio

350 MODERN MACHINE SHOP

January, 19

Mad

You'll fi -rugge

demand

new hig

Victory

in half.

dustries

Wr

(Dec

DA

January,



... for that Big Job?

open vith

there

S.

der w

r use

ompar

Неп

O CO

You'll find the answer in the Rousselle —ruggedly built for today's wartime demands—precision-finished for your new high standards of accuracy. The Victory Vise is built to cut set-up time in half. Early deliveries to War Industries.

Write for Bulletin MM-13 and prices.

(Dealers: a few select territories still open)



Made in four desirable capacities

DAVID J. ROSS CO.

"ACCURATE ENGRAVING with Unskilled Operators"

Engrave Iron, Soft Steel, Copper, Brass, Aluminum, Plastics on the Auto-Engraver



Specially constructed copy holder permits almost any type of set-up.

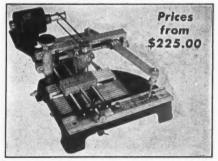
Handles pieces up to 4" x 8" x 36"— Longer with work supported.

Flat or Round Surfaces. Increased production—reduced spoilage—smooth lines. Ratio of pantograph arms 2:1 to 5:1 with intermediate settings.

Easily operated by women.

Send us your problems and blueprints.

PROMPT DELIVERY



Letters and numerals are engraved from master type furnished with machine.

AUTO ENGRAVER CO.

50 W. 46TH ST.

NEW YORK, N. Y.

work. Made entirely in a specially constructed studio at the Gisholt plant, the film, which is entitled "Turret Lathes— Their Operation and Use," is of the 16 mm, size and is available to all recognized trade schools, technical schools, manufacturers, and the like at no charge.

Subject matter covered includes a comparison of the turret lathe with other metal-working machines and detailed sequences illustrating the basic types of work done on a turret lathe and the production methods followed in each case. A folder covering the film in detail is available from the company upon request.

Carboloy Visual Education Program

Designed to expedite the training of new workers in the use, care, and handling of carbide tools, a visual education program comprising essentially a series of six 35 mm. silent slide films is announced by the Carboloy Co., Inc., 11143 E. 8 Mile Rd., Detroit, Mich. Strictly non-commercial in character, the films are designed for instructional



Polishing Machines • Sensitive Drills

purposes and are completely self-eni atory throughout. They are intended enable users of carbide tools to inch production, save time, reduce tool a and tool consumption by a proper derstanding of all the factors related to their application.

The complete program of visual, cation also includes a set of six h lets each containing a reprinted copy one of the films for reference by trainee following the showing of films. Each booklet also contains pendix reference material, charts, other information of value on the

use and handling of carbide tools.

Accompanying the set of booklets
another booklet which gives comp instructions conducting train for meetings at which the films are to shown. The booklet covers not a type of room, general location in bu-ing, and equipment required but a gives complete details as to hand the films, from positioning the protor to rewinding the films. A suggest list of rules governing the conduct of meetings and a typical procedure also given. Estimates of showing to for each film are included as a gi to length of meetings.

The complete set of six silent films cover the following subjects: W Is Cemented Carbide?, Designing mented Carbide Tools, Brazing Cem ted Carbide Tools, Chip Breakers a Their Application, Grinding Single Po Carbide Tools, and Putting Cement Carbide Tools to Work. The films being distributed by Carboloy at pi cost for use as a permanent part of a rent war training programs sponsor by industrial concerns, educational stitutions, and so on. Arrangements also being made for free loaning films to educational institutions thr film libraries maintained by college many states.

NEW BOOKS

Mechanical Drawing. By Ervin Kee on, James McKinney and Tom son, James McKinney and Tom Plumridge. Published by the America Technical Society, Drexel Ave. at \$8 St., Chicago, Ill. 330 pages. 402 trations. Cloth binding, board cove Price, \$2.00.

Profusely illustrated throughout, if book covers the skills and technic knowledge which are required in specialized field of drawing. It inclu

Inci

Elect

and

kind

be fa work

which

mate

facin

Send

30.000

cente

heigh

Table

contre

45° 1

hand

botto:

January



MARQUETTE MFG. CO., INC. . Minneapolis, Minn.

WELDERS

. ARC

30,000 lb. C-F POSITIONER "BOOM-TYPE" BASE

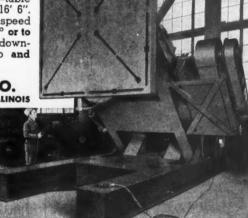
This giant C-F Positioner (capacity 30,000 lbs., 24" away from table, 18" off center) has "boom-type" base—table height adjustable from 6' 0" to 16' 6" Table rotates 360° under variable speed control. Table tilts thru arc of 135° or to 45° beyond vertical - permits downhand welding of all sides, top and bottom.

CULLEN-FRIESTEDT CO.

1311 S. KILBOURN AVE. CHICAGO, ILLINOIS



Boom-type base in angular position increases tilting range and floor clearance.



edure

ring ti 8 gri

ent a ts: W cem

cers a

ement llms i

at pri

onsor

onal i

ents ning

throu

leges

Kesom (nerical t 58 lilu cover

hnia n th

clud

a certain amount of "drill" work on the use of the instruments used in mechanical drawing and shows the student how to become adept in making neat and ac-

curate drawings.

Contents of the book are as follows: Instruments and Materials; Lettering; Geometrical Geometrical Definitions: Problems; Symbols and Conventions; Working Drawing Principles; Projection: Hidden Parts; Sections and Drawing to Scale; Working Drawings and Rules of Projection; Intersections; Developments; Isometric Projection; Oblique Projection; Index.

Oxy-Acetylene Welding and Cutting. By J. W. Giachino. Published by The Manual Arts Press, Peoria, Ill. 133 illustrations. pages. Cloth binding, board covers. Price, \$2.50.

The latest, most up-to-date information on gas welding and cutting is said to be contained in this book, which is especially prepared to show step-by-step details of general and specialty work. The book includes illustrated instructions on the welding of aluminum al-loys and 18-8 chromium steels, as well as data on equipment and method volved in producing regular plate tube welds.

ce wor d meta

apters arts. P

troduct

earing last Fu

es; Bui

he Blas

roducts

ig Iron

ace Sla

"Samp he book nd Ana ampling tone: S ampling

erro-Al

f Blast

nd Ana

ddition

lso inc

Engin

The i ered in

xtendi

resu classes, tinual

neet th n eng

plete a ter but

ticulati

cedure

The simply

in a r

exami numbe

has sh

ment a defi eleme

work

brief

tial 6

theor

eleme with

each

what

cours

be gi

Co

The

sahag.

Each job is explained with direct plication to every-day problems of Useful to e struction and repair. welder or student of welding are active features as charts on metal tification; the official qualification for U. S. aircraft welders, incluillustrated practice welds for the a complete reprint of official Association rules for preventing welding and ting fires, and a reprint of the of regulations for gas systems.

The Blast Furnace. By Roy P. E. son. Published by the Chemical R lishing Co., Inc., 234 King St., Bro lyn, N. Y. 254 pages. 8 illustrate Cloth binding, board covers. Price,

Offered as a means of filling, to m extent, a rather void space in America blast-furnace literature, this book, it stated, should prove of interest to m tical furnace men, fuel preparation gineers, industrial engineers, and co., 15 allurgical chemists. The design of \$4 pag book also makes it useful as a perice, \$10 perice, \$1 book also makes it useful as a re-



American Nat'l Coarse Threads American Nat'l Fine Threads American Nat'l Special Threads In Accordance to A.G.D.

Single End-Double End Plugs — Combination of a thread plug and plain core plug for minor diameters Split Adjustable or Solid Ring Gauges.

(Catalogues Not Available)

Sizes of plugs up to

Sizes of rings from %" to 8" 1.D.





ALLEN GAUGE & TOOL COMPANY

Dept. C, 421 N. Braddock Ave. (21), Pittsburgh, Pa



Designed to use a larger diameter bar than formerly used because the chip is cut in front to make room for the bar. This gives you rigidity, higher boring speeds and heavier cuts.

SEND FOR DESCRIPTIVE FOLDER Representatives in all principal cities.

EVEREDE TOOL

WILLIS STUTSON 180 N. Wacker Drive

Chicago, III.

MODERN MACHINE SHOP

January, 190

Janua

ace work by students of metallurgy ad metallurgical analysis methodi r plate

d metallurgical analysis.
"The Blast Furnace" includes apters which are divided up into four rts. Part I is entitled "Raw Mate-als" and contains chapters headed h direct ems of ul to e g are a metal troductory (The Blast Furnace); Ironearing Materials; Fluxing Stone; last Furnace Fuel; Chemical Princiication last Furnace Fue; Chemical Princies; Burdening the Blast Furnace; and he Blast. Part II, "Products and Byroducts," includes chapters designated ig Iron and Ferro-Alloys; Blast Furace Slag; and Blast Furnace Gas. includ r the Associate and of the offi

"Sampling and Analysis," Part III of he book, has chapters headed Sampling nd Analysis of Iron-Bearing Materials; ampling and Analysis of Fluxing tone: Sampling and Analysis of Fuel; ampling and Analysis of Pig Iron and erro-Alloys; Sampling and Analysis f Blast Furnace Slag; and Sampling nd Analysis of Blast Furnace Gas. In ddition to the 17 chapters, the book lso includes an appendix and index.

y P. R nical P t., Bro Istratio

rice, , to so

Americ ook. it

t to pa

and n

UGE

Engineering Drawing. By Leon Marr sahag. Published by The Ronald Press 20., 15 E. 26th St., New York, N. Y. ation n of t 94 pages. Cloth binding, board covers.

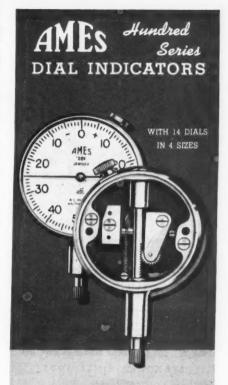
a re Price, \$2.75.

The ideas, methods, and materials offered in this book are a development of both industrial and teaching experience extending over a number of years. As result of extensive use in drawing classes, the material has undergone coninual rounding out and regnement to meet the requirements of a basic course in engineering drawing not only complete and thorough as to subject mat-ter but also characterized by close articulation with the standards and pro-cedures of industrial practice. The purpose of the text can be stated

simply—to offer a maximum of training in a minimum of space and time. An examination of the book will indicate a number of features which experience has shown contribute to the accomplishment of this objective. One of these is a definite endeavor to avoid too many elementary figures in classroom problem work and to make the descriptions as brief as possible, eliminating non-essential exposition and demonstrating the theory by sufficient illustrations.

The book is divided into three parts; elementary, intermediate, and advanced, with a logical sequence of chapters in each part. The first two parts include what will be required in any basic course. The third part, however, may be given to suit local conditions.

Contents are as follows: Introduction;



A COMPLETE NEW SERIES

These Dial Indicators have all the desirable features for measuring and checking accuracy. Four sizes to American Gage Design Commiftee specifications. Fourteen different dial numberings. One-piece, drop-forged cases and stems. Wire attached bezels. Cup-shaped dials that need no springs beneath. Pinions and statis of hardened steel, ground for accurate fitting and long wear. Various styles of backs and contact points. The best and most effective shock-absorbing wheel assembly, optional.

SEND FOR CATALOG NO. 52

B. C. AMES CO. WALTHAM, MASS.



SURFACE

which combine

- STRENGTH
- ACCURACY
- DURABILITY

Available in sizes 12" x 12" up to 96" x 144'. Plates also rescraped.

> Write for illustrated folder and price list

SQUARE SURFACE PLATE & TOOL CO.

221 N. MAIN

ROYAL OAK, MICH.

HEADS

STANDARD SINCE 1915



The United States Drill Head Co.

1954 Riverside Drive CINCINNATI, OHIO

Engineering Lettering; Drawing Out The Use of the Drawing Instrument Geometrical Drawing; Orthograph Projection; Auxiliary and Section Views; Dimensioning and Elements Working Drawing; Axonometric a Oblique Projections; Technical Sket-ing; Fastenings; Piping; Work-Drawing; Steel Structural Drawing Process of Duplication; Manufactural Methods; Materials of Construction: N velopments, Sections, and Intersection of Solids; Perspective Projection Charts, Diagrams, and Graphs; Jand Fixtures; Elementary Machine Drawing; Patent Design: Drawin Room Problems; Appendix; Index

Shipbuilding Blueprint Reading, 1
Joseph L. Tomlinson. Published by the American Technical Society, Drexel And at 58th St., Chicago, Ill. 208 page tended Swire-O binding, heavy cardboard on cres. Price (with answer sheet), the principal aim of this book is teach shipbuilding blueprint reading without requiring students to burd themselves with other principals.

themselves with other principles a closely associated with shipbuilding Closely associated with shipbuildir With this in mind, the author present a simple, straight forward explanation which concerns itself chiefly with a simple shipbuilding at the veloping the necessary skill in visual zation, together with a thorough under standing of the symbols and abbrevi

tions commonly used on ship prints.
The preliminary sections of the but have been arranged to include all bases. information necessary for learning read a ship print. They cover simp arithmetic, a glossary and a dictions of abbreviations of ship terms, metho of projection and relation of view lines, scale and symbols, and metho of developing shapes of surfaces. For lowing each section are test shell which give the student opportunity test out the knowledge he has acqu and to do this in a step-by-step fashio

The problems in arithmetic are b troduced as a review in the manipulation of numbers, fractions, and demals and their application to calcula ing areas, cubage, dimensions, and other simple computations which often a necessary in taking information for blueprints. The glossary and abbrette blueprints. The glossary and abbrevia a round tions, the methods of projection, relations that tion of views, scale, and symbols and up for co all explained in a manner that will help

the student visualize them clearly.

After the student has learned from the preliminary chapters the basic beformation necessary to interpret blueprints, he proceeds to a general di-

ssion herein 1 ations, ained lowledg ninary pical 8 estion th a la A estion e book

Scre

onal B

per left:

inte

ssion based on typical drawings berein the use of all symbols, abbre-ations, projections, and so on, is ex-ained in detail, supplementing the owledge he has gained from the pre-ninary sections. Finally, a group of pical ship drawings together with estion sheets provide the student th a large amount of practical train-g. A separate 27-page answer-toestion sheet is also available with e book.

G Outh

umen

ograph Section

menta ric an Sketci

Workin

rawing

acturi

ion; D

section

jection

Machin

Drawin

ng. B

by th

readin

burd

es n

ith d

unde brevi

its.

e booi 1 basi

ing t

simpl

ethoi

ethod . Fol

ity t

quire shion re is ipula deci-cular

othe n an

revia-rela-s are l help

from

ic in ship

1 dis-

uildin resen anatio

dex.

SHOP LITERATURE Screw Thread and Tap-Drill Standards

Under date of July 28, 1942, a Recom-ended Commercial Standard for Screw breads and Tap-Drill Sizes was circucel An page hreads and Tap-Drill Sizes was critically accordant to for written acceptance in accordance with the action of the Standing k is sommittee on screw threads. Having k is ceived signed acceptance from a satisceived signed acceptance from a satis-ctory majority at that time, the Na-onal Bureau of Standards announces at the Commercial Standard on screw

threads and tap-drill sizes now identified as CS24-43 may be considered effective for new production from February 10, 1943. Mimeographed copy, TS-3356, of the accepted standard will be forwarded one to each acceptor of record. Printed copies will be mailed to nonacceptors only on specific request.

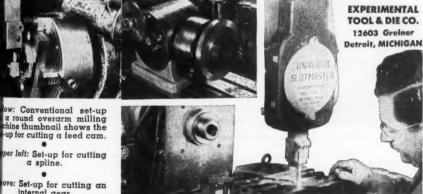
The purpose of the standard is to make available for convenient shop use and acceptance inspection the essential specifications, definitions and dimensional data on screw threads and tapdrills which are recorded more completely in Screw Thread Standards for Federal Services-1942 National Bureau of Standards Handbook H-28.

This standard covers the predominating sizes of American National Screw Threads giving the fits and corresponding tap-drill sizes. Beginning with defi-nitions of terms relating to screw threads and illustrations of terminol-ogy, the standards include symbols and specifications with tables giving the dimensions of threads included in the American National coarse thread and fine thread series with tables of dimensions and tolerances for the various classes of fits, and so on.

of the Many Ways SLOTMASTER Can be Used to Save TOOLS AND SETUPS



SLOTMASTER can be used on any round or flat-on-round overarm mill-ing machine and will do precision work that normally requires a multi-thousand dollar machine. (All work-ing parts are of tool steel heat treated and ground to close tolerances). It takes but little time to change over from one head to the other . . . the stroke of the ram is adjustable from 0 to 4"... the speeds range from 50 to 250 S.P.M. The tool holder is of the clapper box type and can be turned in any position. SLOTMAS-TER comes complete with pulleys, motor, mounting bracket, etc. . . Send for a 4-page catalog — give specifications of the milling machines you wish to equip. Immediate deliveries on high priorities.



ove: Set-up for cutting an internal gear.

"ALNOR" Velometer



An All Purpose Air Velocity Meter---Instantaneous. Direct Reading.

Measures total and static pressures as well as velocities. Write for catalog.

ILLINOIS Testing Laboratories, Inc.

> 153 W. Austin, Chicago

Accurate Hole Transfer Made Easy With NIELSEN TRANSFER SCREWS



Simply insert in holes, invert, strike sharply and you have centers and drill circles perfectly located. Reduce time and eliminate spoilage of other methods. sizes U.S.S. Inexpensive Last for years. Write for Circular.

NIELSEN TOOL & 1863 Gardner Ave. Berkley, Mich.

Better Inspection **Proper Magnification**



This new inspection device is desirable wherever close inspection of tools and parts is necessary. Write for Circular

S. LOWE & SONS CO.

105 Sanford St.

Fairfield, Conn.

sually heavy demand for information relating to methods of increasing production and improving the qual of output from broaches and broach machines.

The first of the articles is based ribes a on actual inquiries from broach we ries for Answers are given to questions con he vario Answers are given to questions on he various ing such subjects as the best types ervation broaching machines to use for differ tors, c jobs, factors governing broaching; g, flam chine speeds, how to avoid "drift" broaching cored cast iron, the amount of stock that can be removed able or broach tooth. Proper depth of sectrode of stock that can be removed able coloroach tooth, proper depth of ectrode breakers, and more than 15 other liso tresmonly asked questions of a sim age arc character.

The second article discusses method of increasing broach life as related sharpening. Included also are recommendations for the storing and has ing of broaches, most suitable sha ening equipment, data on surface bru reconditioning and methods of check to assure peak efficiency and avidamage from improper sharpening sharpenin Drawings showing the proper to forms are also included. Copy of bo let free to broach users upon request

Chemical Publishing Co. 1942-1943 (alog of Technical Books. The Chemical Brooklyn, Co., Inc., 234 King 8 Brooklyn, N. Y., announces that 1942-1943 catalog of technical book now available. The catalog, which is cludes 64 pages, is especially designed to ready reference. Sections are for ready reference. Sections are sidvided so that needed book or book on similar subjects can be found in minimum of time.

The catalog lists books which on every important field, including an tion, engineering, radio, electricity, chanics, chemistry, military and as sciences, and so on, as well as dictionaries of Spanish, Russian, French, and the state of the stat German. Also included in the catal are the Spanish and Portuguese bot of Editorial Tecnica Unida, the Spans subsidiary of the Chemical Publishin Co., Inc. Copy of catalog free to Moder Machine Shop readers upon request.

"Are W al Elec nd orde EA-2704 ree upor

> ion of T hiladelp hould p ivided vith spe lavy an eports a ranches roducts ummary var mat ranches Part 2 f the s uggests tress-st now the of mate Detailed f stress extensor Tables f bars, fla ture, co are also

"Auton

the ti

January, 19

contai

and ma

Copy of

Usen "Red Arrow" Lift Trucks. A fourge illustrated folder covering the op-ating and construction features, speciations, and so on, of its "Red Arrow" fit Trucks is now being issued by Lift rucks, Inc., 2425 Spring Grove Ave., ncinnati, Ohio. Copy free upon re-

o artis ne wor

Co., 1

fich.

ommen e)," h an u

lated reco

shar

bro

hecki

penin

emin g S nat i

ich i

book

ction

1. 81

atale anis

formati sing a "Are Welding Accessories" is the title a 32-page bulletin issued by the Genal Electric Co., Schenectady, N. Y., hich profusely illustrates and deoroachi hich profusely illustrates and de-ribes a complete line of G-E access-th us jes for safe, easy arc welding. Among is com he various items listed are goggles, ob-types ervation shields, ventilated head pro-differ ctors, chrome-leather protective cloth-ing a bg. flameproofed welding screens, ul-driff" aviolet-ray protective paint, metal amm and carbon electrode holders, clamps, ved jable connectors, brushes, chippers, amound carbon electrode holders, clamps, ved; able connectors, brushes, chippers, of ectrode carriers, and fillet-weld gages. ere a lso treated is General Electric's 200-sim age arc welding manual. A price list and order blanks accompany Bulletin meth EA-2704B, copy of which is available ree upon request.

"Automatic Stress-Strain Recording" the title of a 24-page bulletin pub-shed by The Baldwin Southwark Divi-870 to on of The Baldwin Locomotive Works, for Philadelphia, Pa. The bulletin, which quest hould prove useful to engineering and boratory staffs in many industries, is ivided into four parts. Part 1 deals rith specification data of the Army and Navy and includes references to special eports and bulletins issued by individual ranches of the services on specific roducts. This section also contains a ummary of requirements for testing var material, setting forth certain rules and standards in effect with the several trapples of the organization. oks

ranches of the armed services.
Part 2 is devoted to an interpretation of the stress-strain curve. The section uggests methods for the application of tress-strain curve graphs and explains sign e su i in low they may be adapted to the testing of material for the Army and Navy. Detailed descriptions and illustrations 878 nan of stress-strain recorders and accessory extensometers are included in Part 3. Tables for guidance in making tests of ars, flats, sheets, and wires for fracture, compression, flexure, and so on, are also set forth in this section. Part i contains helpful data on the operation and maintenance of recording devices. Copy of Bulletin 162 free upon request.



Carboloy General Tool Catalog. A general tool catalog comprising some 30 pages is announced by the Carboloy Co., Inc., 11143 E. 8 Mile Ave., Detroit, Mich. In addition to information on an expanded line of standard stock tools which now includes a larger number of turning, boring, and facing tools, round shank boring tools, masonry drills, lathe centers, wheel dressers, center grinders, brinnell balls, scraper blanks, reamer blanks, tool blanks, and so on, the catalog presents data on a large number of "Standard Design" tools, and so on, not carried in stock, such as cut-off tools, roller turner tools, grooving tools, shear type tools, solid and expansion shear type tools, solid and expansion reamers, twist drill tips, plug and ring gage bushings, drill jig bushings, guide rings, extruded Carboloy cemented car-bide shapes, and a variety of special blanks. The catalog not only gives specifications and prices but also details on tolerances and numerous illustrations of applications for individual tool types. A list of the 65 leading tools manufacturers now offering Carboloy cemented carbide-tipped tools is also included, indicating the types of tools available from each source. Copy of catalog free to plant executives and production engineers upon request.



Micrometer FRAY OFFSET BORING HEADS

Offsets 3/4"—Head 2%" overall.
Micrometer Dial 50 divisions—.001".
Three Tool Holes—one hole runs true with arbor.

All parts nickel-chromium steel, SAE 340. Two ½" Boring Bars fitted with H.S. Tool Bits and Three Wrenches with each head.

FRAY MACHINE TOOL CO.

503 W. WINDSOR

GLENDALE, CALIF.

Manufacturers of "All Angle"
Milling Machines and Attachments

Ampco Engineering Data Sheet 106 giving case histories of parts m with Ampco Metal, including slides non upsetter and guide pin bushing now available from Ampco Metal, h Milwaukee, Wis., free upon request

Seaboard Engineering Company a nounces the opening of an office at Church St., Paterson, N. J., to do eral Industrial Engineering, special ing on tool and machine design. To office is under the management of G. Zurcher, Vice President, who was a merly with a well-known aeronautic corporation.

Parker-Kalon Self-Tapping Sera The Parker-Kalon Corp., 198 Varick New York, N. Y., has prepared a page pocket-size booklet containing lustrated, tabular, and descriptive formation on its complete line of quity-controlled self-tapping screws. Of of Booklet No. 475 free upon reque

Acheson Colloidal Graphite. A fee page informative bulletin, No. 4218 on the use of "dag" colloidal graph as a lubricant for running-in interaction engines, compressors, and there mechanical equipment has be published by the Acheson Colloids Corport Huron, Mich. Copy free upon quest.

Hardsteel Drills, Reamers, Tool Band Special Tools are covered in dain a 28-page booklet prepared by Black Drill Co., 5005 Euclid Ave., Cleand, Ohio. The booklet not only illustrates and describes the various to but also includes illustrations and a scriptions covering applications of tools, as well as other helpful information. Copy free upon request.

"Grits and Grinds," Vol. 33, Na. This particular edition of "Grits a Grinds" features two informative well illustrated articles entitled "Sa Tooth Grinding" and "A Lesson in C indrical Grinding." Also included is N 10 of the series of cartoons "On finding Line."

Grinding Line."
Copy of "Grits and Grinds" Vol. 2
can be obtained free of charge by wi
ing to the Norton Company, Wom

ter. Massachusetts.

"Chip ect of a IcKenna atrobe, pon requ

"Turco

verhaul

or a r

mazingl

nd deci

nd illu

16-pag Turco or Aircr as been Turco D nc., f Public 135 S. Ce os Ang The equi roce cribed speciall or airc re sa qually o tracto ngine ive

rucks.

gines, ar ar units

Among esses and ment to specially not tank and me tleaning aluminu magnesi the air a spray chemica cleaner, bonizatitons a

bonizati
tons a
small
the degree
cleaning
perature
tors. Co
let free
tives in
engine
and n

upon re

January,

"Chip Breaker Designs" is the subct of a four-page bulletin released by cKenna Metals Co., 300 Lloyd Ave., atrobe, Pa. Copy of Bulletin 442 free pon request.

"Turco Procedure for Aircraft Engine verhaul." Equipment and procedure or a new, radically improved, and mazingly fast method of degreasing and decarbonizing aircraft and other ngine parts for overhaul is described and illustrated in

16-page booklet, Turco Procedure or Aircraft Engine overhaul," which rick 8 as been issued by ining furco Products, title nc., Department of the furco Public Relations, s. c. 135S. Central Ave., reque Los Angeles, Cal. The equipment and rocedure decribed although A for specially designed 4218 or aircraft duty graph are said to be inter qually applicable o tractor and tank as be engines, automos s Contive equipment, pon rucks, Diesel engines, and all simi-ar units.

Sheet :

arts m

lides 1

shings etal, I

quest

pany ;

ice at

do G

Special

gn, 1

of G

Was fe

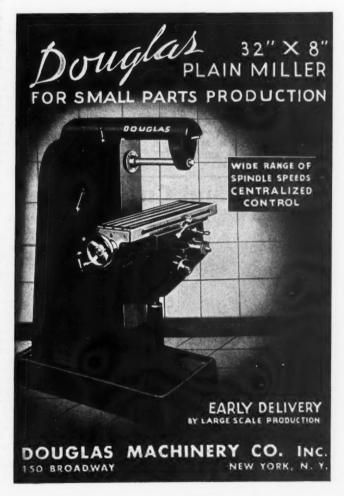
onauti

Sere

rs, u

Among the procamong the proc-ol be esses and equip-old ment treated are by t specially devised not tank chemicals Clen y illu s too and methods for leaning steel, nd d aluminum, a n d magnesium parts, form the air and solvent spray table, the chemical vapor cleaner, the decarbonization of pistons and other small parts, and the degreasing and cleaning of oil temperature regulas N tors. Copy of bookn ti let free to executives in charge of engine overhaul and maintenance upon request.

Century Motor and Generator Installation and Maintenance Bulletins. Century Electric Co., 1806 Pine St., St. Louis, Mo., is now issuing a series of bulletins containing unusually seven helpful information on the installation, care, and adjustment of Century repulsion start induction single phase mofractional horsepower capacitor single phase motors, split phase motors, squirrel cage induction polyphase motors, fractional horsepower direct current motors, integral horsepower direct current motors, and direct current generators. Copies free upon request.





DRILL and PILOT BUSHINGS Frictionless -Rotar

For core drilling, T.
C. and high speed
boring, turret to ol
piloting, etc. Won't
stick or clog. Dust proof as a watch. Write for details.

GIERN & ANHOLTT TOOL CO.
1312 Mt. Elliott Ave. Detroit, Mich.

South Bend Turret Lathe Catalog 67-W. The South Bend Lathe We Dept. 4Z, South Bend, Ind., has a neight-page catalog illustrating describing in detail South Bend. Turret Lathes together with numerous catalog in the second se attachments and accessories which available for adapting these mach to various types of production w The important construction features the lathes and their operation are Tabulated specifications plained. full information on capacities, spec ward Le feeds, and dimensions. Copy of Cap alletin 2 No. 67-W free upon request.

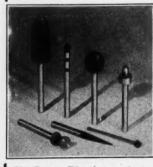
For Machine and Tool Work and Quick Set-Ups

The only 3-way reading precision indicator. Accurate in either direction. Feeler mounted in centered cone bearings. .014 reading. Price \$5.00 Plus Postage. Write for folder. Priority Rating Required.

R. REICH MFG. CO. 45 E. Stroop Rd. Dayton, Ohio

De-Sta-Co Toggle Clamps. A 10-10 bulletin covering a complete line of the sta-Co Toggle Clamps for clamp and parts in production has been public on and by the Detroit Stamping Co., 349 belland Ave., Detroit, Mich. The bulk mitation land Ave., Detroit, Mich. The bulle includes illustrations of the variance types of clamps together with drawn giving complete dimensions of each lustrations showing the clamps in use stribute well as illustrated and descriptive formation on De-Sta-Co Toggle Plateric C and the De-Sta-Co "C" Clamp quick-acting toggle movement. quick-acting toggle movement. Copy Bulletin No. 42 free upon request.

ALJO Hand Cut OTARY FILES



High Speed or Carbon Steel

Prompt Shipments

Aljo Rotary Files for nearly every purpose —contours, recesses, corners, grooves, radii and fillets—stock and specials.

Many styles in stock.

WRITE FOR ILLUSTRATED BOOKLET.

ALJO MFG. CO., Inc., Southport, Conn.

Detrex Metal Parts Washers. Al page catalog illustrating and descriptantace ing in detail various types of Detrears of Metal Parts Washers for use wi alkali cleaning compounds, petroler spirits, and emulsion cleaners togen ulleti with the many features of design in fichigar construction incorporated in these Blight chines is announced by the Detroit & Vinishing Products Co., 13017 Hillview Ave., by which is troit, Mich. Special adaptations of the Detrex Washers for war armament may gan Too ductions, particularly in the aircal industry, are treated. Four pages of the catalog are devoted to blueprint to assembly drawings covering in addetail the construction of washers ing both belt and monorail conveyor

Triad Alkali Cleaning and Strippi Compounds for cleaning of metal parand which are used in conjunction the Detrex Washers are described. De trex equipment designed for degrees shot testing, and other processing also covered in the catalog, copy which will be sent free of charge up receipt of a request addressed on company letterhead.

"AAF ir page inf Americ ntral Av e more ms and t America ntrol an

mic valu e Ward trohm S stor which be es igh unitatt rat nportant nents is r

> Michiga inishe 10. 861-4

ial int nanufac inches er is a culleti E. McNi Detroit, bulletin, lesignat No. 861-4 nformat design a ng feat machine feed of and so o cations : ed cover of gear can be

cutter s

"AAF in Industry" is the title of a page informative bulletin announced American Air Filter Co., Inc., 100 ntral Ave., Louisville, Ky. The bulin illustrates and describes a few of e more general industrial dust prob-ms and their solution through the use American Air Filters and AAF Dust ntrol and Collecting Systems. Copy ee upon request.

spec Ward Leonard Vitrohm Strip Resistor. Cata alletin 23 giving dimensions, ratings, mic values, and other information on

e Ward Leonard trohm Strip Restor which is said be especially lited for applica-10-pa on in aviation, rao, and installa-ons where space ublish mitations and igh unit space att ratings are ents is now being istributed by the tive lectric Co., Mount ernon, N. Y. Co. portant require-ments is now being ree upon request. Сору

atalog ne Wo

Bend

numen which

machi

on w

atures

are ons g

e of

clampi

349 1

bulle

vario

Michigan Gear inisher Bulletin A vial interest to describe the continuation of less than a will inches in diamerole er is a descriptive get oullet in on the man dichigan No. 861-B Light Duty Gear it R Tinishing Machine in Bulght Duty Gear it R Tinishing Machine in gan Tool Co., 7171 ren 2. McNichols Rd., of the person of the sum of the s o. 861-42. Of spe-8 W No. 861-42, contains nformation on the eyon lesign and operatng features of the machine, its scope, feed of operation, . De and so on. Specifications also includd cover the range ed cover the range of gear sizes that can be handled, n cutter sizes, drive

motor data, and overall dimensions. Copy of bulletin free upon request.

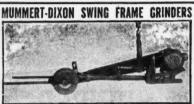
Advance Products Folder. Advance Polishing Wheels, Inc., 844 W. 49th Pl., Chicago. Ill., is now issuing a fourpage folder describing and illustrating Advance Cup and Saucer Wheels, Rolled End Buffs and Polishing Bobs, Balancing Weights, Electric Glue Pots, and Improved Balance Ways. Copy free upon request.



"Hyper-Milling," a new method for the face-milling of steel with Firthite-tipped cutters, is the subject of a 12page illustrated bulletin now being distributed by the Firth-Sterling Steel Co., McKeesport, Pa. Copy of Engineering Bulletin No. FE-106 free upon request.

Wheelco Thermocouple Data Bulletin. A six-page bulletin recommending certain material thermocouples, thermo-

couple protecting tubes, and lead w for pyrometric instruments as a subs Aero T tute for materials which have become 36-page critical has been issued by the Wheeler rged, co. Instruments Co., Harrison and Peer ass polists., Chicago, Ill. Designed prime ow being to guide instrument users restrict 1 W. C. from use of chromium and nickel all talog i thermocouples, tubes, and wire by an fills, but cent WPB conservation order, the bank equaletin includes practical information daptors, the construction of thermocouples, it ills, plores in the construction of thermocouple checks wet set millivolt conversion tubes, and of usezer data helpful to an instrument user. Construction of the conversion tubes, and of usezer conversion tubes. free upon request. e rear free to



Sizes 12", 14", 16", 18", 20" and 24" wheels.

Ask for Descriptive Circular

M U M M E R T - D I X O N 120 Philadelphia St. CO. Hanover, Pa. Kennametal Tool Catalog 43. To o t Property of the McKen applications are announced in a page catalog prepared by the McKen and the Metals Co., 300 Lloyd Ave., Latron ad spectra of the Catalog in addition to train standard, non-standard, and spectra of Foundard with Kennametal standard the Foundation of the Foundatio show the correct rate angles for any the remade with Kennametal standard in Co. blanks. For each style of standard in Related an operational illustrate shows the proper use of the tool. The catalog is divided into three rate of the collection of the collection of the catalog is divided into three rates and the catalog is divided

tions: (1) Standard Tools, (2) Typic Nonstandard Tools, and (3) General I formation. The latter section include specific information on the origin a qualities of Kennametal; how to spa fy and order tools and blanks; di breakers for tools; grinding tools; hi to avoid grinding cracks, brazing stand ard blanks to tool shanks; milling states of Pre folder with tipped cutters of simple designifications of Kennametal, a cillustrations of examples of machinic ee.

operations performed with Kennamea Copy of Catalog 43 free to person addressing a request on their compan letterhead.





LINLEY Noiseless **Rotary Rivet Spinning** Machine

Made in a wide range of sizes and types for from or cold rolled steel rivets up to 3/2". Also larger rivets of softer materials. 3/2 %, chrome nickel steel spindles, heat treated and ground are supported at ground are supported at lower end in a double row radial thrust bearing which carries radial load AND riveting thrust load.

Write for complete details.

LINLEY BROS. CO.

661 State St. Ext.

Bridgeport, Conn.



CENTERLESS GRINDING ACCURACY - PROMPT SERVICE

Commercial Centerless Grinding [1.] Cleveland, Oli 6603 Cedar Avenue

MODERN MACHINE SHOP

January, 19

364

anuary,

mension spacition spacition cok mamco dot Pre-

"Clam tle of atalog i

djustab 0., 417 1 ve., Ch overing

ete line bleand ble ste andscre r clar orged

lamps

lamp

lamps, r lamps

lamps,

vood be

lead w a sub Aero Tool Cupforged Aircraft Tools.

de beca 36-page plastic bound catalog of cuprged, comparameter inspected, microrged as polished precision aircraft tools is Wheel rged, comparameters are dependent of the set of the content of the content

lathe dogs, and so on. Copy of Catalog No. 16 free upon request.

Kempsmith Milling Machines. An eight-page illustrated bulletin covering the features, construction, specifica-tions, and so on, of the Kempsmith Maximiller and Type "G" Miller, both of which are available in plain and universal types, has been prepared by the Kempsmith Machine Co., Milwaukee, Wis. Various attachments for these machines are also treated. Copy of bulletin free upon request.

Famco Arbor and
oot Presses. A
yles a ur - page folder
ntaining illustramedian ons, descriptions,
Latro nd specifications
treating Famco Arbor
special foot Presses
of two y the Famco Mandar dine Co., 1324 18th
lard to ... Racine, Wis. ndai ine Co., 1324 18th inard in ... Racine, Wis. istration cluded with the look. The look is a four-ree as gedata sheet Typin No. 7-B) giving mensions, load apacities, and gin as or space require-ospecials; in the look is in the look in the look

ompartitle of a 32-page atalog now being istributed by the djustable Clamp 0., 417 N. Ashland ve., Chicago, Ill., overing a com-lete line of adjustble and nonadjustble steel spindle andscrews, steel ar clamps, droporged steel Clamps, carriage lamps, body lamps, machinists' lamps, welders' lamps, steel bar lamp fixtures, wood bar clamps,

"Clamps" is the

amet

person

NG

Œ g te



American Thread Dressing Tools are made for all makes of thread grinding machines. Each diamond used is selected for its original characteristics and set to fit the individual demands of the tool.

Every American tool is made with the care and precision required to give maximum performance, then rigidly inspected; modestly priced, and guaranteed to perform satisfactorily.

Get acquainted with American Diamond Tool values; send your order today.

DIAMOND TOOL & GAUGE CO. 15928 WOODINGHAM . DETROIT, MICH.

365

G-E Totally Enclosed Induction Motor for use in magnesium, aluminum, and other combustible metal dusts is described and illustrated in Bulletin GEA-3922 now available from the General Electric Co., Schenectady, N. Y., free upon request.

Whitney-Jensen Aircraft Tools for punching, forming, and riveting are treated in a 48-page catalog prepared by Whitney Metal Tool Co., 110 Forbes





St., Rockford, Ill. The catalog inchi st., Rockford, III. The catalog incr. ides ill illustrated, descriptive, and tabular ides ill formation on aircraft rivet squeer blind rivet pullers, hand punch angle iron machinery, power squar shears, toggle action foot presses, propunch presses, bending brakes, propured brakes, and small tools such as rate brandles, rivet sets soretch as rate. handles, rivet sets, scratch awl scratch pins, and so on. Copy f upon request.

tin No. 261 free upon request.

REID PRECISION-PLANED SURFACE PLATES The bul

Chicago, III.



column. Special fixtures for Tee-slotted tables, light milling work, etc. Hand and/or foot control. Shipped on approval to responsible concerns. MEAD SPECIALTIES COMPANY

Dept. 13AA

Accuracy guaranteed on 12" x 18" size 14 stand. within .0005". On 36" x 72" within .0015 ool bit

Thoroughly normalized and weather set standard soned Reid Precision - Planed Surface ip tools Plates have proved thoroughly satisface mendation

tory on work to close limits.

Excellent delivery—Write for prices—details

Tool Engineering Service Co., In. are also

241 Washington Ave. Nutley, N. I several hand an 241 Washington Ave.

HILL "C inder e Hill Cle lletin i ns, and and de" Hy e upon

Univers ool & D oit, Mic ge cat otmaste chment n be a ny roun - rour achine itting plets, ternal otting o blan

nd mole The n The

Co., Uni Carbide Corp., 3 t. New

"Stel

15 S. Market St.

"Open Side" Hydraulic Surface inder Bulletin H-V-3. Released by 6 Hill Acme Co., 6400 Breakwater e., Cleveland, Ohio, this four-page lletin includes illustrations, descripns, and specifications on both verti-and horizontal spindle Hill "Open de" Hydraulic Surface Grinders. Copy e upon request.

Universal Slotmaster. Experimental ol & Die Co., 12615 Greiner Ave., De-oit, Mich., now has available a fourge catalog regarding its Universal of of the comment of the commen

n be adapted to ny round or flat-round milling achine for use in itting keyways, mplets, splines, ternal gears, for otting out precisn blanking dies nd molds, and so n. The catalog in-udes illustrations nd detailed inforsquare x different setups es, por f the attachment. es, pr lopy free upon re-uest.

g inch abular

squeeze

a wl opy fi

"Stellite 98M2 and fittel-Cutting Tools teel or or Machining and diteel" is the sub-bulled ect of a six-page gineen ulletin issued by of Bull he Haynes Stellite Co., Unit of Union Carbide & Carbon Corp., 30 E. 42nd St., New York, N. Y. TES the bulletin lists izes and prices of 4 standard square only on d rectangular only on bits and 74 er set standard weldedurlace lip tools. Recomtislac mendations regardng grinding wheels for use on tools made of 98M2 alloy Inc. are also given for everal types of and and machine

grinding operations. Copy of Bulletin Form 5783 free upon request.

Duronze Manual. A revised edition of its manual on Duronze, a high strength, corrosion-resisting silicon bronze, has been published by the Bridgeport Brass Co., Bridgeport, Conn. This 80-page Co., Bridgeport, Conn. This 80-page manual contains technical data and information on applications for five different Duronze alloys supplied in sheet, rod, wire, tubing, and ingot form. Copy free to engineers addressing a request on their company letterhead.



To hold parts together for operations such as drilling, spot welding, or riveting, Knu-Vise Pliers have proved exceptionally efficient because there is no time wasted in fastening or releasing them. One flip of the lever applies the required pressure and another flip releases the work just as quickly. Holding of work is simplified and production is stepped up. Let us show you efficient methods of holding parts for speedy production. Send for new catalog

2201 Eighth Street, Detroit, Mich. 4328 San Fernando Rd. Glendale, Calif.

American Workman's Wartime Pledge Card. As part of a continuing program of tool conservation inaugurated before the war, the Koebel Diamond Tool Co., 9346 Grinnell Ave., Detroit, Mich., has published an "American Workman's Wartime Pledge" card, to be issued free of charge to all who request it. The pledge is unique in that it requires no signature, thus becoming a completely voluntary act on the part of the worker.

The Koebel Conservation Program originated with the issuance of a poster bearing the legend "When any man adds a single hour to the production life of a tool, or makes that tool do better work, that man makes a worth-while contribution to American ideals and to America's future." This poster is reproduced on the reverse of the card.

Every workman who receives the card pledges that: "As a soldier in our mighty production army, upon whose skill and unstinting labor the lives of millions and the freedom of all depend, I pledge that I will take care of my tools and machines, that I will help and instruct my fellow workmen whenever I am able, and that I will waste neither time nor materials, to the end that all of America's productive resources may be dedicated to final and complete victory."

"Suttonizing" Welding Method. A page catalog containing complete in mation on the "Suttonizing" was method for the reclamation of a speed steel tools together with 88 method and so on, reclaimed by this method announced by the Welding Equipm & Supply Co., 223 Leib St., Den Mich. Copy free upon request.

Ward L y is the

Mou

on req

Davis-Na

magn

hydra

neral

Wheelco Instrument Bulletin 741 dillust Wheelco Instrument Co., Harrison 1 Peoria Sts., Chicago, Ill., has issued 16-page bulletin containing a condem listing of its complete line of massing and control instruments. Unit of struction of temperature controllend described and illustrated as is the company's "electronic principle" for obtaining control without contact between measuring and control functions of instrument. In addition, the bulk covers combustion safeguard equipment rushes remote controllers, and other instruments. Prices as well as number alletin complete catalog sections on each pley The of equipment are also given. Copy Bulletin Z-6100 free upon request.



234 SIZES



SPRINGS



Compression Type
HARDWARE PRODUCTS CO.
105 Richmond St. • Boston, Mass.



MODERN MACHINE SHOP

January, Manuary,

thod i Ward Leonard Midget Metal Base Re-plete in y is the subject of Bulletin 104 re-g" well ased by the Ward Leonard Electric Mount Vernon, N. Y. Copy free on request. n of h th 88 in , broach

> Davis-Made Solenoids. Two new avis-Made Laminated Solenoids degned to supply a straight-line thrust, magnetic action, for the operation hydraulic valves as well as for other neral industrial uses are described

nd illustrated in a lletin announced y Dean W. Davis Co., Inc., 549 W. ulton St., Chigo, Ill. Copy free oon request.

method

Equipm

t., Detr

tin 2-0 rrison u s issued Condens

f meas

Unit of

trollers the co or obtain

betwe

est.

ZY

n

Inc

troit

ons of f as bulk Carbone Carbon quipms rushes is the subrims et of a six-page and subrims et of a six-page and subrims et of a carbone Copy orp., Boonton, N. The bulletin inudes a table of pplications, inforation on brush efinitions and andard brush unt connections, nd detailed speci-cations of a numer of frequently sed grades of Car-one Brushes. Copy f Bulletin No. 942 ee upon request.

> Fray Ram Type 6. 7-B Vertical iniversal Milling fachines. The wide ersatility of the ray Ram Type 10. 7-B Vertical Iniversal Milling Machine is graphcally described in six-page catalog ssued by the Fray fachine Tool Co., 03 W. Windsor, Glendale, Calif. In addition to treatng the versatility

of this machine, the catalog also includes complete specifications of the unit. Copy free upon request.

HydroLectric Lift Truck. A folder illustrating and describing the features, construction, operation, advantages. uses, and so on, of the HydroLectric Motorized Lift Truck is now being dis-tributed by Lift Trucks, Inc., 2425 Spring Grove Ave., Cincinnati, Ohio. Copy free upon request.

ETCHING STAMPS for CODE MARKING NOW MADE IN AN Amazing New Material

Results of tests in actual production have shown that Matthews new "S-22" Synthetic outlasts the best rubber or other synthetic stamps from three to four times! The new "S-22" Synthetic is unaffected by acid etching inks.



The popular Peg Style illustrated is used where large volume inspection stamping of metal parts and assemblies is required.

PIN

POSITIVE HOLDING

WRITE FOR BULLETIN S-CATALOG 146 This valuable bulletin illustrates the various styles of stamps available. Write for your copy today!

3944 Forbes Street

NEW YORK CHICAGO PHILADELPHIA

Branch Plants
BOSTON NEWARK SYRACUSE



Pittsburgh, Pa.

District Sales Offices DETROIT CLEVELAND BIRMINGHAM



METAL & ROLLING MILLS, Inc HUDSON AVE BROOKLYN

"Faster Production with Tocco" Little the of a 16-page booklet release rection title of a 16-page booklet release The Ohio Crankshaft Co., 3800 Itan Ave., Cleveland, Ohio, covering e of 8 dge an Tocco process of induction heating booklet is divided into sections ar and trating and describing Tocco open principles in hardening, brazing, an ing, and heating metal. The bu steps i the booking skill also includes illustrated and specific formation on the design of Tocco la Heat Treating Machines. Copy free nded to on request. l such

Use CORTLAND SEGMENTAL CHUCK

for better, faster surface grinding CORTLAND GRINDING WHEELS CORP. CHESTER, MASS.



automatically oil every working part with a fog of oil in the air that drives the tool! Guard against wear in use, against corrosion when idle. Many combinations to meet your particular needs.

Get Catalog 400

C. A. NORGREN CO. Denver, Colo.

Micarta Data Booklet. Designed to ki sa a safe-page data booklet Micarta, an all-purpose industrial into the Westingham Electric & Mfg. Co., Dept. 7-N-2, B. ch of Pittsburgh, Pa. The booklet discussions of the safe and the saf the manufacture of Micarta and the general forms in which it is supplied laminated and molded. Comprehens tables list standard Micarta shapes the maximum and minimum dimensi in which they are available. The he let also includes grade selection is together with graphs indicating the together with graphs indicating the ideal is ative mechanical, electrical, and the one and ical properties of each grade. A ve text. ticular section of the booklet discus Included machining and molding of the plate is full-properties. Copy of Booklet B-3184 free upon repictur quest. quest.

Oakite Wartime Maintenance Dip Issued by Oakite Products, Inc., Thames St., New York, N. Y., this gest concisely describes how new, to saving cleaning materials, describ methods, and related techniques are fectively helping metal-working plu successfully solve the wartime pr lems of conserving manpower, shorts ing equipment shutdown time, and start to the function of the and sanitation jobs.

Prepared in data sheet form for of venient, quick reference, the digest of lines in each cleaning or related i discussed (1) the material used, (2) method followed, (3) time saved, fire or other hazards eliminated, (5) other advantages gained essential increasing operating efficiency as a sobtaining greater output and long service. service from existing production, pressing, and power equipment and chines. Copy free upon request.

nd page the arings. inding age wa itting t rew thi g the read for cy after rinding a head ear, a v

With pa ft - han rough

ows 801

ting ope

rts and

cation

he. On

January, Manuary, 1

oper

hich a

ool is u

roduce

iews of

us type nd Ship The

ound

oard which v

reservi

Cocco" Little Things Make Perfection, But release fection Is Not a Little Thing" is the 800 Han e of a 64-page book prepared by overing dge and Shipley, Cincinnati, Ohio, eating ich describes and illustrates in a characterism wanner some af ar and interesting manner some of steps involved in the building of the dern Lodge and Shipley lathe. The book is designed to show how o operat ing, and he boi

ny skills, applied with sweat and toil ny skins, appried d ceaseless attention to detail, can be inded to produce a modern machine of such as the Lodge and Shipley the.

With pages 9 x 12 inches in size, every

ft-hand page ft-hand page roughout the ook is a full-page production of a strial production of a strial pi stingho stringho close range, close range, discus some intersupplis or the supplis of the supplies of the supplie

ctions

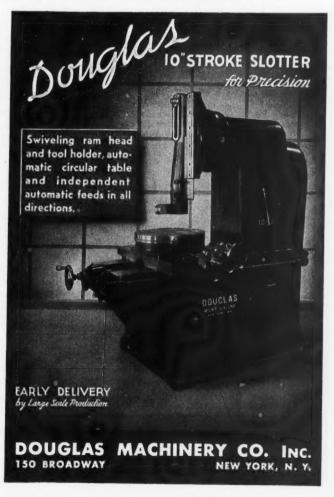
specific occo Ju

py free

g the ons and on the order of t inding the carage way strips,
e operation of
lac.
this rew thread testw, tin a the carage way strips,
e operation of rew thread testw, in g the leadscrew
leach read for a c c u
are to y after cutting,
y pla
rinding the teeth
e pn a headstock face
shorts
ear, a view of one
of sta f the furnaces in
vib high the grears vita the furnace with the gears nd other parts are eat treated, turn-ng operations in eat treated, turng operations in
hich a machine
ol is used to reroduce itself, and
lews of the varius types of Lodge
d Shipley Lathes.
The book is ound in stiff oard covers, which will aid in

Copy of this book can be obtained by mechanical executives who address requests on their company letterheads.

"Keep 'Em Working," a 46-page booklet designed to aid users of "Caterpillar" products in getting the most out of their machines, has been published by the Caterpillar Tractor Co., Peoria, Ill. Copy of the booklet will be sent free of charge to users of Caterpillar equipment requesting Form No. 7609.



reserving it.

s wi

d m

CATALOG LIBRAR

To obtain copies of the catalogs listed here, indicate on the coupon the number of the item in which you are interested and mail as directed.

1. Lift Trucks

The Hydroelectric motorized lift truck is illustrated and described in folder issued by Lift Trucks, Inc., 2425 Spring Grove Ave., Cincinnati, Ohio.

2. Grinding Facts

A practical book of grinding facts, titled "Better Grinding," contains 100 pages of helpful data on grinding. Issued by Landis Tool Co., Waynesboro, Pennsylvania.

3. Milling Machines

Illustrations, outline of features, and specifications of Kempsmith Maximillers and Type G Millers are contained in Bulletin 101, issued by Kempsmith Machine Co., Milwaukee, Wisconsin.

4. Degreasing Machines

A new 24-page catalog illustrating and describing Detrex Solvent Degreasing Equipment has been issued by Detroit Rex Products Co., 13017 Hillview Ave., Detroit, Mich.

5. Universal Milling Machines

The Fray Ram Type No. 7-B Vertical Universal Milling Machine is illustrated and described in new Catalog issued by Fray Machine Tool Co., Glendale, California.

6. Electric Furnaces

Electric furnaces for industrial and laboratory uses are detailed in folder released by Cooley Electric Manufacturing Corp., Indianapolis, Ind.

7. Gas Cracking Unit

Hevi-Duty Electric Co., Milwaukee, Wis., has published Bulletin HD 1042, giving information on the Hevi-Duty Gas Cracking Unit.

8. Air Motors

The construction and uses of Senar Air Motors are described in a m bulletin offered by Smith-John Corp., 623 E. 12th St., Los Angel California.

9. Wet-Dry Belt Surfacing

Porter-Cable Machine Co., Syram N. Y., has published a 20-page on log, giving the details on the Wel-D Belt Surfacing method.

10. Abrasive Cutting

Manufacturers doing production of ting of steel, brass, bronze, mo metal, ceramics, plastics and ghavill find "Abrasive Cutting" book helpful. Available from Andrew Campbell Division, American Cha & Cable Co., Bridgeport, Conn.

11. Multiple Precision Grinding

Fitchburg Multiple Precision Gibing book shows how to cut grinding costs. Issued by Fitchburg Grindin Machine Corp., Fitchburg, Mass.

12. Gear Chamfering Machine

Literature illustrating and describing the Cross No. 50 Universal Canchering Machine is available from Cross Gear & Machine Co., I troit, Michigan.

13. Metal Cutting Saws

Circular Tool Co., Inc., Provideo R. I., has published Catalog K, for turing Circle "R" Metal Cuttin Saws.

14. Drill
Bulle
Sible
swin
Sible
20 E.

Taps The

Ohio taps. 16. Corre Book ing'' Avai

St., (17. Decir John Broo mal

Twis

Emp and from Corp Mich 19. Tapp Dorn

MOI 431

Janu

No..

Com

Com

City

4. Drill Presses

Bulletins illustrating and describing Sibley Drill Presses in 20", 24" and 25" swing sizes have been published by Sibley Machine and Foundry Corp., 20 E. Tutt St., South Bend, Ind.

The Wood & Spencer Co., Cleveland, Ohio, has available catalog featuring taps.

16. Correct Drill Pointing

Booklet titled "Correct Drill Pointing" will help conserve cutting tools. Available from Chicago - Latrobe Twist Drill Works, 411 W. Ontario St., Chicago, Ill.

17. Decimal Equivalents Chart

John Hassall, Inc., 394 Oakland St., Brooklyn, N. Y., has available Decimal Equivalents Chart.

18. Levelling Jacks

Empco Levelling Jacks are illustrated and described in literature available from The Enterprise Machine Parts Corp., 2733 Jerome Ave., Detroit, Michigan.

19. Tappers

f Senan

in a n

- John

Angel

Syracu

age can

Wet-D

tion c

e, mor nd gla book drew n Cha

nn.

Grin

grindia Frindin 188.

scribin l Ger vailab . D

ideno

Cuttin

ry, IN

Dorman Tappers for driving any tap

up to 1" are described in literature published by Dorman Machine Tool Works, 357 Canal St., New York, N. Y.

20. Vises

Drill press and machine vises are illustrated and described in literature available from J. E. Martin Tool & Die Works, 548 State St., Springfield, Ohio.

21. Vertical Milling Machines

Gorton Super-Speed Vertical Milling Machines for light production milling, tool work, jig boring, etc., are illustrated and described in catalog released by George Gorton Machine Co., 1318 Racine St., Racine, Wis.

22. Electric Furnace

Bulletin No. 50, issued by Cooley Electric Manufacturing Corp., 213 S. Senate Ave., Indianapolis, Ind., de-tails Cooley furnace for heat-treating small parts.

23. Radius-Angle Former

Literature featuring the Meyers "Dia-brasive" Radius-Angle Former is available from W. F. Meyers Co., Inc., Bedford, Ind.

Print plainly in filling out coupon for literature.

MODERN MACHINE SHOP

431 Main Street, Cincinnati, Ohio

I am interested in receiving the following literature reviewed in your January Issue.

No..... No.. No..... No......... No...... (Insert numbers denoting literature you want.)

Name Title.....

Company

Company Address

..... State.....

SERVICES DIRECTORY

GRINDING • STAMPINGS • TOOL and DIE WORK MACHINE WORK • CASTINGS • HEAT-TREATING FORGINGS • EMPLOYMENT • BUSINESS • ETC.

PATTERNS

Wood and Metal — also Match Plates. For all kinds of castings—large or small. Estimates on Request.

GENERAL PATTERN WORKS
2231 Buck St., North of Harrison Ave.
Phone MAin 4751
Cincinnati, Ohio

AUTOMATIC AND HAND SCREW MACHINE PRODUCTS

... up to 24" diameter—any material—small or large quantities. Prompt service.

IMSANDE SCREW PRODUCTS CO. 3517 Cardiff Ave. Oakley, Cincinnati, Ohio

GRIND THE

Eastern Centerless Way

Our new plant with increased facilities

PROMPT SERVICE

Eastern Centerless Grinding Co.

470 Tolland St. East Hartford, Conn.

Screw Machine Work

Have capacity to handle additional screw machine work from ¾" diameter to 2" diameter.

BROWN ENGINEERING CO.

CENTERLESS GRINDING

SINCE 1925

CINCINNATI

ICE PICK & TONG MFG. CO.

118 BURROWS ST. . CINCINNATI, 0.

CENTERLESS GRINDING

Straight, Cylindrical, Shoulder, Profile, as Multiple Diameters. Ground Taper is Screw Machine Products. Heat treated as ground if necessary. Improved and expands facilities insure prompt and accurate seria. Send blueprints or samples for estimate.

PORTER MACHINE CO. 3139 Enyart Ave., Oakley, Cincinnati, Oli

PRECISION GROUND

GEARS THREADS CAMS SPLINES

Excellent facilities for grinding gears, cams, threads and splins on a contract basis.

SEND BLUEPRINTS FOR ESTIMATE

MACHINERY COMPANY

Hartford, Conn.

Advertise Your Service in the SERVICES DIRECTORY SECTION WRITE FOR RATES MODERN MACHINE SHOP 431 MAIN ST. CINCINNAL.

WA

Require Lathe (Wheels ber an bles, I

Drills.

Terms: Credit of York, of sion of will be send u present pointing

> Referen Ltd., 22 Messis. House, Garrett gow, C

POST B

The mission for the dministrolled ince against materia

Materia recruit one of All av demons and se certain make

possible It is cations alread work.

sons v perien num, highly those chine (2) ele

Januar

WANTED IN INDIA

Required Sole Agency for India for Lathe Chucks, Machine Tools, Grinding Wheels, Hardwares, Small Tools, Rubber and Hair Beltings, Graphite Crucibles, Dies, Taps, Twist Drills, Bench Drills, Hand Drills, Electric Drills, etc.

Terms: Payment will be made by Letter of Credit against Shipping documents in New York, and we will take our usual commission of 5% on all orders. Import Licenses will be submitted against each order so send us your catalogues, price lists and present discounts. Also send letter of appointing Agents by Air Mail.

References: Messrs. W. J. Groom & Co., Ltd., 22 Fenchurch Street, London, E.C.3, Messrs. Holt Whitney & Co., Ltd., Dominion House, Whittall Street, Birmingham, Messrs. Garrett & Taylor, Ltd., 45 Hope Street, Glasgow, C2, England.

BAKHSHI RAM & CO.

UNIVERSAL HOUSE

POST BOX No. 246

DING

G. CO.

NATI, O.

NG

ofile, m

aper Pin

expande

e service

timates.

CO.

MS INES

nding

plines

ATE

IAL

e

LION

HOP

TL 0.

y, 190

LAHORE (INDIA)

C. M. Plan Creates Need for Specialists

The United States Civil Service Commission has begun a nation-wide search for the production specialists who will administer War Production Board's new Controlled Materials Plan. The Controlled Materials Plan, designed to balance essential industrial production against available stockpiles of critical materials, will go into operation in 1943. "Many hundreds of Production and Materials Control Specialists must be recruited," the Commission states, "for one of the biggest of home front jobs. All available men whose experience demonstrates their ability to coordinate and schedule industrial production in certain fields are being called upon to make their services available wherever possible.

It is made clear, however, that applications are not sought from persons already using their highest skills in war work.

Urgently sought right now are persons with industrial or engineering experience in the fields of copper, aluminum, carbon steel, and alloy steel. Also highly important to this program are those with such experience in (1) machine tool and machinery production; (2) electrical and communications equip-



PRECISION GRINDING

A COMPLETE PRECISION GRINDING SERVICE

CENTERLESS GRINDING
INTERNAL CYLINDRICAL
GRINDING
EXTERNAL CYLINDRICAL
GRINDING
BLANCHARD SURFACE

GRINDING
BLANCHARD SURFACE
GRINDING
PLAIN SURFACE GRINDING
THREAD GRINDING



Send Blueprint Sketch or Samples for Quotation

ACE MANUFACTURING CORP.
1221 E. Erie Avenue, Philadelphia, Pa.

Hand Screw Machine Products

UP TO 3" BAR OR CHUCK.
PRODUCTION MILLING ON DUPLICATE
MACHINE PARTS.
GAUGES, JIGS, FIXTURES AND SPECIAL
MACHINES.

BEAVER MACHINE & DIE CASTING CORP.

1137 W. Belden Ave.

Syracuse, N. Y.

ment; (3) transportation equipment, such as aircraft, ships, and railroad motive power, and rolling stock; (4) engineering materials such as plastics, rubber, and construction materials.

Under the plan, these persons will be appointed to WPB, War, Navy, and other war agencies to assist in the allotment of critical materials going into military and essential civilian supplies and equipment. They will determine the material needs of manufacturers, schedule production, and follow up production to insure the flow of critical materials according to plan.

Head Specialists will receive \$6,500 a year; others \$4,600 and \$5,600 a year. Many positions, however, must be filled at salaries ranging from \$2,000 to \$3,800

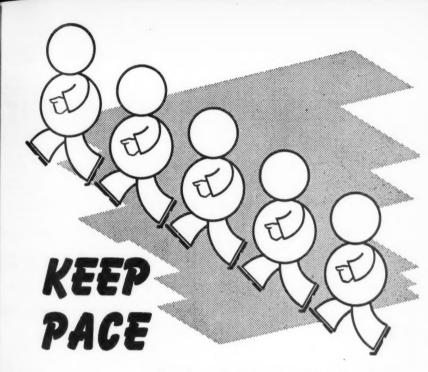
Persons interested may obtain the Commission's announcement No. 279 concerning the jobs from local representatives at first and second-class post offices, or from the U. S. Civil Service Commission, Washington, D. C. No written test will be given, and there is no maximum age limit.

Applications with the title "Production Control Specialist," or "Materials Control Specialist" inserted, should be filed with the Commission's Washington office, and will be accepted until the needs of the service have been met.

WHEN I WAS YOUNG, WE DIDN'T HAVE EITHER GIRLS OR MOTOR BIKES IN THE MACHINE SHOP!

WHEN YOU WERE YOUNG, YOU WALKED TO WORK, WORKED IO HOURS A DAY, YOU WEREN'T ALLOWED TO SIT DOWN DURING WORKING HOURS, AND WOMEN'S PLACE WAS IN THE HOME. IF THEM WAS THE GOOD OL' DAYS, I'LL TAKE MINE NOW!!

ALAURICE PRINT



If your company has moved or if you have changed positions, please fill in and mail the coupon below. This will enable you to keep pace with the developments and items of interest in the metal-working field as published in Modern Machine Shop.

FILL IN AND
MAIL TO:

MODERN
MACHINE
SHOP

AND MAIN STREET
CINCINNATI
OHIO

NAME _____

TITLE _____

COMPANY _____

ADDRESS ______

CITY _____STATE ____

My copies of MODERN MACHINE SHOP have been addressed to me previously at:

COMPANY ADDRESS CITY STATE



WHERE TO FIND IT

Duplic Dust Electr Engra Envelo

Facing Files, Files, Filing Finish Finish Fixture Flexib Forger Forgin

Forme

Found

Furnace 62.

Furnit

Gage !

Gage Gages 261 Gas C Gear (Gear (

Gear I

Gears 321 Gradu Grinde

Grinde

Grinde

Grinde Grinde Grinde

Grinde Grinde

Grinde Grinde Grindi Grindi Grindi Grindi

Grindi 203, Grindi Grindi Grindi

Grindi

Grindi Grindi Grindi Grindi Grindi 78 Grindi

Grindi

Grindi Grindi 263, Hamme

Hand 343

Hardne

Heating Hinges Hobbir Hobs,

Januar

Abrasives, Abrasive Cloth, Paper, Discs, Stones, Etc., 244, 191, 215, 225, 159, 249, 88 Adapters, 66 Air-Operated Equipment (Look for specific item) Alloys, 292, 317

Balancing Machines, 7
Balancing Ways, 210, 58
Bar Cutting Machines, 378
Bearings, Ball, First Cover
Bearings, Boller, First Cover, 1
Bearings, Colless, 186
Bearings, Colless, 186
Bearings, Boller, First Cover, 1
Bearings, House, First Cover, 274
Bench Legs, 284
Bending Machines, 212, 334
Bending Rolls, 378
Blades, Centerless Grinder, 87
Blades, Cutting-Off, 218
Blowers, 62
Bolts, 299, 4, 53, 383, 315
Boring Bars, 308, 319, 354
Boring Bars, 308, 319, 354
Boring Machines, 3, 19, 72, 73, 64
Boring Machines, 3, 19, 72, 73, 64
Boring Mills, Vertical, 97
Boxes, Shop, 284, 311
Boxes, Stacking, 284, 311
Boxes, Tote, 311
Brakes, Press and Bending, 119, 307, 334
Broaches, 185, 115, 381, 73
Broacheng Fixtures, 381
Broaching Fixtures, 381
Broaching Fixtures, 381
Broaching Machines, 8, 9, 115
Bronze Bars, 175
Buffers, Bench and Pedestal, 249, 404, 82
Burners, 62
Burners, 62
Burners, 523, 320, 321
Bushings, Brass, Bronze, Etc., 175
Bushings, Drill Jig, 73, 327, 316, 362, 368
Bushings, Liner, 327

Calipers, 85
Cams, 103
Carbide Tips and Tools, 185, 187, 271, 104, 34, 35, 389, 397, 325, 318
Castings, Machine, 280
Centers, Index, 246
Centers: Lathe, Planer, Miller, Etc., 58, 86, 337
Centrifuges, 21
Charts, Trigonometry, 165
Chisels, 245
Chucking Machines, Automatic, 21
Chucks, Air and Hydraulically-Operated, Second Cover
Chucks, Collet, 131, 125, 122, 123
Chucks, Drill, 40, 51, 347

Chucks, Lathe, Second Cover, 243 Chucks, Magnetic, 243, 100, 336 Chucks, Segmental, 370 Chucks, Tap. 206, 260, 251, 293, 40, 5 Clamps, 276, 106, 53, 383 Clamps, Air. 366 Clamps, Toggle, 134 Clinching Machines, 239 Clutches, 272, 288 Comparators, 171, 201, 12, 13, 24, 331 Coolant Fittings, 61 Coolant Systems, 61 251, 293, 40, 51 Coolants, 61, 42 Counterbores and Countersinks, 185, 213, 71 103, 297, 320, 377 Couplings, Flexible, 294, 332 Granes, 101, 54 Cut-Off Machines, 291, 391, 309, 345 Cutter Sharpening Machines, 8, 9 Cutters, Flue Sheet, 272
Cutters, Flue Sheet, 272
Cutters, Milling, 185, 193, 213, 239, 261, 143, 200, 55, 69, 73, 45, 399, 315, 341, 342, 6
Cylinders, Hydraulic and Pneumatic, Second Cover, 239, 75 Cylinders, Hydraulic and Pneumatic, Second Cover, 239, 75
Demagnetizers, 243, 100, 58, 339
Diamond Wheels, 179
Diamonds and Diamond Tools, 164, 236, 254, 251
136, 104, 36, 44, 63, 333, 365
Die Cushions, Pneumatic, 37
Die Feeds, 226, 246, 315
Diemakers' Supplies, 259, 294, 314, 315
Die Making Machines, 306, 379, 18
Die Sets, 259, 294, 314, 315
Dies and Die Heads, Threading, 161, 171, 151
Dies, Chaser, 171, 121, 12, 13
Dies, Chaser, 171, 121, 12, 13
Dies, Drawing, 104
Dividing Heads, 243, 46
Dogs, Lathe, Grinder and Miller, 206, 106, 32
Dressers, Grinding Wheel, 164, 216, 236, 234
268, 136, 249, 104, 36, 58, 44, 63, 333, 385
Drill Heads, 40, 94, 356
Drilling Machines, Automatic, 22, 94
Drilling Machines, Multiple Spindle, 285, 23
391, 72, 89, 94, 378
Drilling Machines, Multiple Spindle, 285, 23
391, 72, 89, 94, 378
Drilling Machines, Radial, 147, 117, 14, 391
Drilling Machines, Radial, 147, 117, 14, 391
Drilling Machines, Radial, 147, 117, 14, 391
Drilling Machines, Radial, 147, 117, 22, 391, 89, 378
Drilling Machines, Sensitive, 255, 352
Drilling Machines, Sensitive, 255, 352
Drilling Machines, Radial, 147, 117, 22, 391, 89, 378
Drilling Machines, Radial, 147, 117, 22, 391, 89, 379
Drilling Machines, Radial, 147, 117, 22, 391, 89, 379
Drilling, Maling, Tapping and Screw-Insense Machines, Automatic, 96
Tills, Center, Core, Twist, Etc., 161, 213, 277
Drills, Portable Electric, 173, 249, 404
Drills, Square and Hexagon, 262
Drives, Motorized, 190, 265, 269, 273, 295, 28 Duplicating Machines, 143 Dust Control Equipment, 262, 404

Electroplating Equipment, 102 Engraving Machines, 143, 344, 351 Envelopes, 270 Etchers, 143, 58, 337, 339, 344

Facing Machines, 64
Files, 270, 276, 129, 28, 321
Files, Rotary, 320, 321, 362
Filing Tools, Portable Electric, 343
Finishes, Machine Tool, 60
Finishing Machines, Abrasive, 363
Fixtures, Chucking and Indexing, 166, 305 Flexible Shaft Equipment, 391 Forgings, 339
Formers, Grinding Wheel, 136
Foundry Riddles, 46 Forges, 62 Furnaces, Heat Treating, Oil, Gas, Etc., 127, 52, 62, 359

Furniture, Shop, 339

Gage Blocks, 241, 274, 152, 153, 24
Gage Handles, 325, 335
Gages, 242, 161, 181, 193, 197, 207, 227, 231, 141, 261, 334, 257, 201, 24, 85, 327, 331, 334
Gas Cutting Apparatus and Supplies, 277
Gear Chamfering Machines, 77
Gear Cutting Machines, 11, 342
Care Finishing Machines, 183

Gear Finishing Machines, 183 Gears and Gear Units, 244, 248, 276, 286, 298, 5.

213, 271

254, 28

171, 121

106, 53 236, 254 , 365

285, 2 391 , 89, 371 nserting

213, 271

95, 39

ry, 190

143, 25, 2, 6 Secori

Gears and Gear Units, 244, 248, 276, 286, 298, 5, 321
Graduating Machines, 143
Grinders, Abrasive Band, 290
Grinders, Air, 43, 323
Grinders, Bench, 249, 404
Grinders, Carbide Tool, 200, 256, 82, 363
Grinders, Face Mill, 17, 379
Grinders, Pedestal, 404, 82, 92, 363
Grinders, Portable and Tool Post, 82
Grinders, Portable and Tool Post, 82
Grinders, Portable Electric, 43
Grinders, Swing Frame, 404, 46, 364
Grinders, Tool Bit, 379
Grinders, Wet, 82
Grinding Machines, Centerless, 8, 9
Grinding Machines, Centerless, 8, 9
Grinding Machines, Centerless, 8, 9
Grinding Machines, Cutter and Tool, 258, 202, 203, 143, 379, 55, 73, 74, 82, 352
Grinding Machines, Disc, 82, 88
Grinding Machines, Disc, 82, 88
Grinding Machines, Drill, 296, 379
Grinding Machines, Drill, 296, 379
Grinding Machines, Internal, 207, 167, 3, 95
Grinding Machines, Snagging, 363
Grinding Machines, Snagging, 363
Grinding Machines, Snagging, 363
Grinding Machines, Snagging, 363
Grinding Machines, Spline, 48
Grinding Machines, Thread, 171, 12, 13, 73, 90

78, 95 Grinding Machines, Thread, 171, 12, 13, 73, 90 Grinding Machines, Universal, 246, 287, 25, 27, 84, 90, 48 Grinding Wheel Heads, 48 Grinding Wheels, 244, 176, 177, 215, 225, 158, 263, 99, 397, 41, 32

Hammers, Rawhide, 196 Hand Tools, Power, 173, 211, 249, 404, 43, 323, 343

January States Testing Devices, 195, 29
Heating and Ventilating Equipment, 378
Hinges, 188, 340
Hobbing Machines, 303
Hobs, 185, 213

Hoisting and Conveying Machinery, 101, 75, 54, 53, 311

Holders, Boring Bar, 319 Holders, Indicator, 128 Holders, Tools, 229, 260, 251, 143, 106, 293, 69, 53, 377

53, 377
Hollow Milling Machines, 362
Honing and Filing Tools, Portable Electric, 343
Honing Machines, 80
Hopper Units, Motorized, 205
Hose, Flexible Metal, 145
Hydraulic Equipment (Look for specific item)
Indicators, 197, 201, 85, 355, 362

Inspection Devices, 24, 171, 201, 12, 13, 358

Jacks, Leveling, 223 Jig Borers, 246, 256, 117, 17, 84

Keyway Cutting Machines, 244, 270, 308

Ladders, 248 Lapping Machines, 202, 203, 8, 9, 16, 73 Laps, 299 Laps. 299
Laihes, Automatic, Third Cover, 171, 7, 12, 13, 23, 30, 31, 387
Lathes, Bench. 224, Third Cover, 155, 30, 31
Lathes, Engine and Toolroom, 170, Third Cover, 155, 235, 144, 19, 30, 31, 400, 83, 327
Lathes, Polishing, 391, 82, 363
Lathes, Polishing, 391, 82, 363
Lathes, Turret, 171, 305, 7, 12, 13, 19
Lathes, Turret, 171, 305, 7, 12, 13, 19
Lathes, Vertical Turret, 204
Layout Materials, 180, 312
Levels, 348
Levers, Pull-Feed, 46
Lighting Equipment, 252, 135, 340
Lightwave Measuring Equipment, 327
Locating Tools, Optical, 17
Lubricants, 266

Magnifiers, 24 Mallets, Rawhide, 196 Mandrels, Expanding, 208, 329 Markers, Electric, 58, 344 Marking Machines, 194, 142 Mats, Floor, 254 Meters, Air Velocity, 358

Lubricants, 266 Lubricators, 370

Meters, Air Velocity, 358
Microscopes, 24
Milling Fixtures, 67
Milling Machines, Automatic, 8, 9
Milling Machines, Automatic, 8, 9
Milling Machines, Horizontal, 264, 98
Milling Machines, Horizontal, 246, 8, 9, 19, 39, 46, 84, 361
Milling Machines, Horizontal, 246, 8, 9, 19, 39, 46, 84, 361

46, 84, 361 Milling Machines, Universal, 8, 9, 15, 17, 39 Milling Machines, Vertical, 246, 256, 143, 8, 9, 280, 10, 39, 84 Mills, End, 174, 217, 103, 297 Motors, 132, 269, 101, 391 Mounted Wheels, 176, 177

Nibblers, 172, 258 Numbering Machines, 298, 303 Nuts, 143, 53, 383

Oilers, 300 Oils, Cutting, 133, 59, 42 Oils, Grinding, 160 Oils, Lubricating, 211

Oils, Soluble, 59

Pans, Coolant. 61
Pans, Lathe, 250
Pans, Tote. 248
Parts, Machine Tool, War Material, Etc.. 207, 227
Pencils, 268
Pilots, 377
Pins, 259, 327, 315
Pipe Tongs, 53
Planer-Millers, 97
Planers, 97, 19, 26, 68
Plates, Lapping, 219
Plates, Screw, 161
Plates, Screw, 161
Plates, Surface, 192, 219, 307, 356, 366
Pliers, 245, 367
Polishing Machines, 352
Polishing Machines, 352
Polishing Machines, 352
Polishing Machines, 255
Power Units, Hydraulic, Second Cover, 73
Presses, Airo-Operated, Second Cover, 73
Presses, Foot, 303
Presses, Foot, 303
Presses, Power, 170, 246, 378, 380
Presses, Power, 170, 246, 378, 380
Presses, Punch, 246, 307, 388, 378
Presses, Sub, 342
Profiling Machines, 280
Pullers, 137
Pumps, Coolant and Lubricant, Second Cover, 267, 20, 333
Pumps, Hydraulic, Second Cover
Pumps, Injector, 73
Pumps, Vacuum, 330
Punch Press Feeds, 226, 246, 315
Punches, 300, 383

Ratchets. 245, 53
Reamers. 185, 213, 246, 247, 257, 69, 45, 327, 315, 347
Riveters. Portable. 75
Riveting Machines. 239, 254, 364
Rules. Measuring. 231

Safety Equipment, 304 Sanding Machines, Belt and Disc. 228, 46 Saw Blades, Hack, 234, 243, 85, 390, 323, 319, 349 Saw Guides. Band. 210, 337 Saw Sharpening Machines 228, 126, 338 Sawing Machines, Band, 199, 209, 391, 47, 71, 76, 18 Sawing Machines, Hack, 199, 283, 289, 313 Saws, Band, 238, 279, 85 Saws, Circular, 81, 91 Saws, Segmental, 221 Screw Drivers, Hand, 245 Screw Machine Tools and Products, 103, 106, 122, 123, 21 Screw Machines, Automatic, 157, 21, 72 Screws: Cap. Set. Socket and Machine, Fourth Cover, 259, 93, 4, 57, 328, 315 Screws, Self-Tapping, 4 Screws, Thumb, 53 Screws, Transfer, 358 Services: Dies. Jigs. Milling. Grinding. Lapping. Business, Etc., 242, 374, 375, 55, 327, 364, 385 Shaper-Planers, 68

Shearing Machines, 119, 334, 378, 380
Sheet Metal Parts. 317
Slotting Machines, 68, 345, 371
Socket Specialty Products, Fourth Cover, 32
249, 95, 53, 57, 328, 315
Solders, 370
Spacing Collars, Arbor, 252
Speed Reducers, 248
Spindles, Grinding, 73
Spotlacers, 272
Springs, 259, 315, 368
Sprockets, 324
Staking Machines, 301
Stamping and Marking Tools, 193, 261, 298, 33
310, 322, 369
Steel, Ground Flat Stock, 85
Steel, High Speed, 383
Steel, Ground Flat Stock, 85
Steel, High Speed, 383
Steel, Tool, 34, 35, 383, 339
Stools, 339
Surfacing Machines, Abrasive, 391, 363

Tink

1

Tables, Rotary and Index, 158, 143
Tap Extractors, 346
Tapes, Measuring, 231, 85
Tapping Attachments, 206, 149, 293, 40, 94
Tapping Heads, 206, 293, 40, 94
Tapping Machines, 149, 293, 22, 40, 65, 72, 94
Taps, 101, 193, 261, 65, 45, 326, 386, 315, 341
Taps, Collapsible, 21
Threading Machines, 2, 65, 70, 50, 342
Tool Bits, High Speed Steel, Carbide, Etc., 18
187, 271, 104, 302, 34, 35, 389, 397, 69, 325, 18
Tool Banks, 187, 389, 318
Tool Chests, 249, 368
Tool Posts, Turret, 266, 275
Tools, Air, 249
Tools, Bering, 307
Tools, Bering, 257, 308, 319, 354, 343
Tools, Carbide-Tipped, 185, 187, 271, 104, 33
35, 389, 397, 325, 318
Tools, Facing, 343
Tools, Form, 185, 230, 103
Tools, Form, 185, 230, 103
Tools, Fipe, 106
Tools, Riveting, 301
Tools, Shaper, 69
Tools, Shaper, 69
Tools, Shaper, 69
Tools, Special, 185, 213, 227, 272, 137, 249, 21
300, 399, 377
Tools, Threading, 168, 343
Torches, 62
Trucks, 281, 311
Tubing, Flexible Metal, 145
Turrets, Lathe, 182, 184, 275, 46, 313
Turret Mills, Vertical, 384

Valves, Air Control. Second Cover, 169, 229, 5 Valves, Hydraulic Control. Second Cover Valves, Relief and Reducing, Second Cover Vernier Attachments, 309 Vises, Bench and Machine, 214, 216, Second Cover, 243, 130, 266, 143, 315, 344, 349, 31, 106, 278, 301, 305, 400, 46, 49, 331, 340

Welding Equipment and Supplies. 101, 37, 353
Wire and Band Cutting Machines, 350
Wrenches, 189, 245, 137, 249, 106, 53

Sharpening Fixtures, 103

Shapers, 246, 119, 282, 26, 68, 84, 342

Janu

VICTOR'S BARGAINS IN **Tungsten Carbide Tipped Tools**

Price \$1.00 Each In Any Size

New Low Prices—Increase Production—Cut Operating Costs

Tools are tipped with Tungsten Carbide, and are suitable for machining castiron, brass, bronze, aluminum, non-ferrous materials (such as hard rubber, bakelite, fibre), and tough alloy steels up to 500 Brinell hardness.

Left—100 Series

Left Hand-Reverse Image, Right Hand Shown

Tool No. RH	LH	Shank Size	
R-100	L-100	1/4 x 1/4 x 2	
R-101	L-102	75 x 75 x 21/4	
R-103	L-104	3/8 x 3/8 x 21/2	
R-105	L-106	$\frac{7}{16} \times \frac{7}{16} \times 3$	
R-107	L-108	$\frac{1}{2} \times \frac{1}{2} \times 3\frac{1}{2}$	

SERIES 100

Right-200 Series Tool No. Shank Size 1/4 x 1/4 x 2 To x 16 x 21/4

Below-300 Series

Tool No.		Shank Size	
	300	1/4 x 1/4 x 2	
	301	16 x 16 x 21/2	
	302	% x % x 21/2	
	303	1/2 x 1/2 x 31/2	

3/3 x 3/3 x 21/2 202 203 7 x 1 x 3 204 1/2 x 1/2 x 31/2

200

201

Cover, 14

1, 298, 3

63

10, 94 5, 72, 94

Etc., 18

, 104, 31

249, 25

, 239, 8

over

349, 351

01, 27

y, 196

STANDARD TUNGSTEN CARBIDE TIPPED TOOL BITS

In lots of 12 assorted in any Series; 100-200-300 Series an extra 10% will be allowed: also in lot of 50 assorted 20% discount will be allowed.



Sizes not listed as well as special TIPPED TOOLS will be quoted upon request. When ordering, state tool number and quantity desired. We Carry Silicon Carbide Emery Wheels for Grinding Tungsten Carbide Tool Bits.

SERIES 200

251 CENTER STREET Phone: CAnal 6-5575 **NEW YORK, N. Y.**

The Last Word . . .

THE books have been closed on the Year of Our Lord 1942, and opened on the year 1943. History will record these two years as the most important in the life of the United States up to this time, and they may very easily be the most important for centuries to come. For in these years—and perhaps 1944—the world will learn that however slow America may be to anger, when sufficiently angered it fights, and when America goes into battle, it goes in to win—and DOES win.

Civilization progresses in the art of making war, as in other things. To an extent never before equalled this is a war of metals and machines—machines to transport troops quickly to the point of impact, and machines to fight with when they get there. No more do soldiers march great distances; today they travel in trucks, tanks, planes and ships and fight with machine guns, cannon, automatic rifles, anti-aircraft guns, torpedoes, and huge bombs. All of these items are the product of the machine shop; thus the machine shop is the most important establishment behind the lines.

The attack on America was a challenge to the ability and spirit of the American people and to America's industries. Both have met the challenge American war plants are now turning out more fighting materials than all of the Axis plants together, and in many cases more than the rest of the world

The first item needed was steel. Germany has capacity for 24,700,000 tons. Germany, the rest of Europe in the Axis camp, and Japan together can make a total of 61,000,000 tons. In 1942 America turned out 91,000,000 tons of steel; America, Russia, and the British Empire together turned out a total of 133,400,000 tons. And to a large extent that figure is indicative of our ability to out-produce the Axis countries.

Next to the materials, the most important item in production is tools-principally machine tools. There are about 250 kinds of machine tools, varying in size from approximately that of a sewing machine to the bulk of a three-story house. The shortage in machine tools was the first bottleneck of the war program, due to the fact that machine tools were essential for the manufacture of all other kinds of machinery and tools. The machine tool industry is now geared up to produce as many machine tools each month as were produced in an entire year before the war, or a yearly production amounting to about 120 millions of dollars.

Since Pearl Harbor our capacity for aircraft production has been multiplied $3\frac{1}{2}$ times; ordnance production, $6\frac{1}{4}$ times; naval vessels, $2\frac{3}{4}$ times, and merchant vessels, 5 times.

By the end of 1943 the War Manpower Commission expects that 9,700,000 citizens will be in the armed forces, to equip which 20,000,000 workers will be needed in war industries. At this writing about 3 million of the workers in the war plants are women, with more thousands training to take jobs at the bench, machine, or on the erecting floor. Many of these women maintain their homes, in addition to their war-plant work. Others have left office and sales jobs to add their bit to the war effort.

But the most significant feature of this shift of our people from their accustomed ways of life to new tasks is the spirit that makes it possible—a spirit born of freedom and of determination that that freedom shall be maintained in America.

We can't lose!

Howard Campbuy